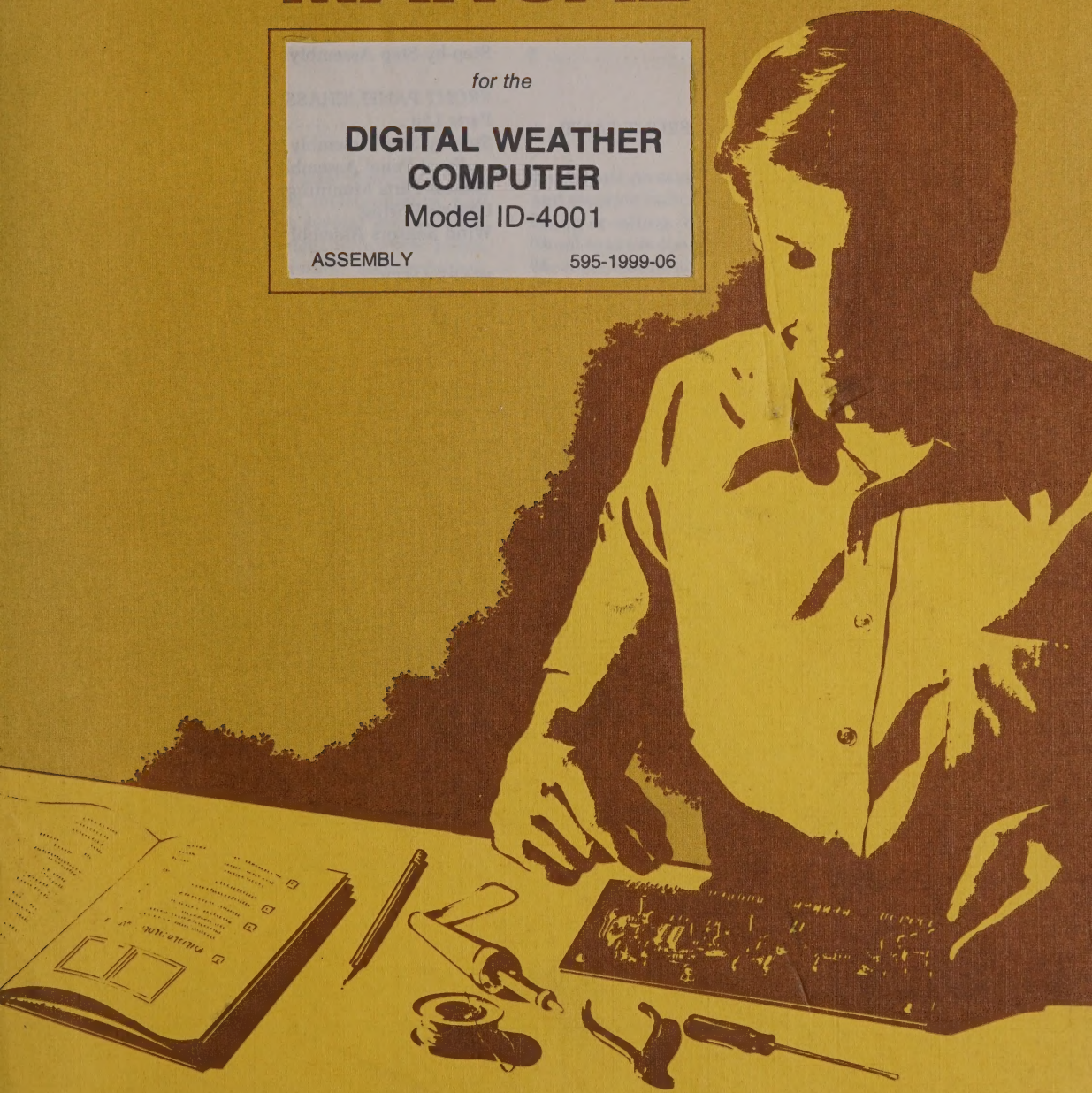
HEATHKIT® MANUAL

for the

DIGITAL WEATHER COMPUTER

Model ID-4001

ASSEMBLY 595-1999-06



HEATH COMPANY • BENTON HARBOR, MICHIGAN

HEATH COMPANY PHONE DIRECTORY

The following telephone numbers are direct lines to the departments listed:

Kit orders and delivery information ..... (616) 982-3411
Credit ..... (616) 982-3561
Replacement Parts ..... (616) 982-3571

Technical Assistance Phone Numbers
8:00 A.M. to 12 P.M. and 1:00 P.M. to 4:30 P.M., EST, Weekdays Only

R/C, Audio, and Electronic Organs ..... (616) 982-3310
Amateur Radio ..... (616) 982-3296
Test Equipment, Weather Instruments and
Home Clocks ..... (616) 982-3315
Television ..... (616) 982-3307
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Computers ..... (616) 982-3309

YOUR HEATHKIT 90-DAY LIMITED WARRANTY

For a period of ninety (90) days after purchase, Heath Company will replace or repair free of charge any parts that are defective either in materials or workmanship. You can obtain parts directly from Heath Company by writing us at the address below or by telephoning us at (616) 982-3571. And we'll pay shipping charges to get those parts to you — anywhere in the world.

We warrant that during the first ninety (90) days after purchase, our products, when correctly assembled, calibrated, adjusted and used in accordance with our printed instructions, will meet published specifications.

If a defective part or error in design has caused your Heathkit product to malfunction during the warranty period through no fault of yours, we will service it free upon proof of purchase and delivery at your expense to the Heath factory, any Heathkit Electronic Center, or any of our authorized overseas distributors.

You will receive free consultation on any problem you might encounter in the assembly or use of your Heathkit product. Just drop us a line or give us a call. Sorry, we cannot accept collect calls.

Our warranty does not cover and we are not responsible for damage caused by: incorrect assembly, the use of corrosive solder, defective tools, misuse, or fire; or by unauthorized modifications to or uses of our products for purposes other than as advertised. Our warranty does not include reimbursement for inconvenience, loss of use, customer assembly or set-up time.

This warranty covers only Heathkit products and is not extended to allied equipment or components used in conjunction with our products. **We are not responsible for accidental or consequential damages.** Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

If you are not satisfied with our service (warranty or otherwise) or with our products, write directly to our Director of Customer Services, Heath Company, Benton Harbor, Michigan 49022. He will make certain your problems receive immediate, personal attention.

HEATH COMPANY
BENTON HARBOR, MI. 49022

The Heath Company reserves the right to discontinue products and to change specifications at any time without incurring any obligation to incorporate new features in products previously sold.

Heathkit® Manual

for the

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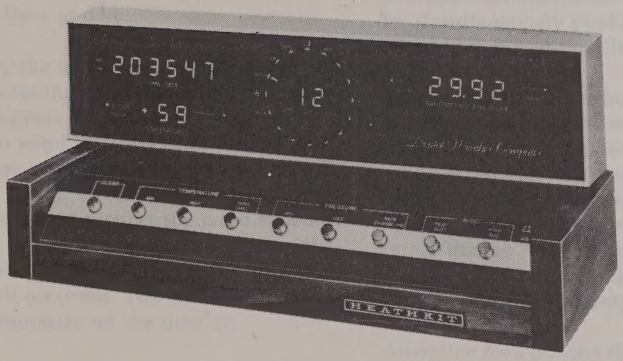

HEATH COMPANY
BENTON HARBOR, MICHIGAN 49022

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INTRODUCTION

The Heathkit Model ID-4001 Digital Weather Computer is a microprocessor-based meteorological unit which measures and displays several weather variables. These variables are useful to boaters, pilots, farmers, amateur radio operators, meteorologists, climatologists, and general comsumers.

The Computer contains a 6-digit clock which displays time in either a 12- or 24-hour format. A 4-year calendar also uses the same six digits on alternate cycles, or you can use a rear panel switch to continuously display the time or date.

Two digits display the wind speed while one of sixteen indicators shows the wind direction by compass point and radial degrees. A rear panel switch lets you select whether the wind speed is in miles-per-hour, knots, or kilometers-per-hour and a front panel indicator shows you which is selected. A front panel switch also allows you to display the wind speed as an instantaneous or average wind. Another switch recalls the maximum gust from memory along with the date and time it occurred. You can also hold this date or time continuously on the display.

Indoor and outdoor temperatures are alternately displayed with a 2-1/2-digit display. A separate indicator shows you which temperature is displayed and whether the temperature is in Celsius or Fahrenheit. A front panel switch enables you to recall from memory what the highest or lowest temperature was and the date and time it occurred. Another front panel switch lets you display the wind chill temperature. Two rear panel switches (which pertain to temperature) allow you to display the temperature in °C or °F, and hold the display at either an indoor or an outdoor reading.

Barometric pressure is displayed by a 4-digit display, and separate indicators show whether the pressure is rising or falling. You can use switches on the front panel to cause the display to show the rate of change per hour, and recall from memory the date and time of minimum or maximum pressure. A rear panel switch allows you to display the pressure in millibars or inches of mercury. Indicators also show whether the display is in millibars or inches of mercury.

You can clear any, or all, memory contents at any time by simultaneously pushing the corresponding front panel button and the Clear button.

Terminal strips on the bottom of the Computer allow you to connect a chart recorder (with external slope and intercept scaling) to make permanent records of outdoor temperature and barometric pressure. You can also connect an external battery (6.2 to 14.8 VDC) to the terminal strips to hold the memory contents intact during "brown-out" or power interruptions. Typical battery current drain during power interruptions is only 50 milliamps at 9 volts.

An option for a plug on the CPU circuit board directly interfaces this Digital Weather Computer with other Heath Computers for the purpose of computer assisted research.

Your Digital Weather Computer will provide a vast amount of valuable weather information, and its handsome styling will be attractive in any decor.

UNPACKING INSTRUCTIONS

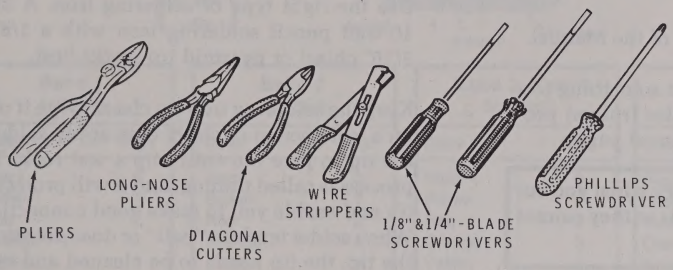
Locate the "Pack Index Sheet" that is packed inside the carton. This sheet identifies the location of each pack. Packs 1, 2, and 3 are in separate compartments and contain the circuit board parts. The remaining parts will be considered the final pack.

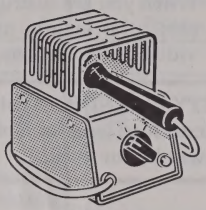
The Assembly Manual has four (4) Parts Lists, one for each pack. Each Parts List has its own unpacking instructions that you should read carefully. Never unpack more than one pack at a time.

ASSEMBLY NOTES

TOOLS

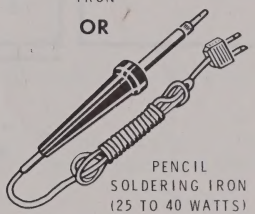
You will need these tools to assemble your kit.





HEATHKIT SOLDERING IRON

OR

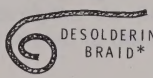


PENCIL SOLDERING IRON (25 TO 40 WATTS)

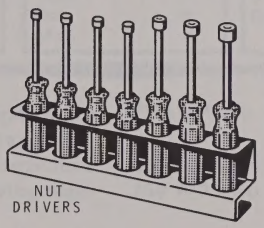
OTHER HELPFUL TOOLS

DESOLDERING BULB*

NUT STARTER (MAY BE SUPPLIED WITH KIT)



DESOLDERING BRAID*



NUT DRIVERS

*TO REMOVE SOLDER FROM CIRCUIT CONNECTIONS.

ASSEMBLY

1. Follow the instructions carefully. Read the entire step before you perform each operation.

2. The illustrations in the Manual are called Pictorials and Details. Pictorials show the overall operation for a group of assembly steps; Details generally illustrate a single step. When you are directed to refer to a certain Pictorial "for the following steps," continue using that Pictorial until you are referred to another Pictorial for another group of steps.

3. Most kits use a separate "Illustration Booklet" that contains illustrations (Pictorials, Details, etc.) that are too large for the Assembly Manual. Keep the "Illustration Booklet" with the Assembly Manual. The illustrations in it are arranged in Pictorial number sequence.

4. Position all parts as shown in the Pictorials.

5. Solder a part or a group of parts only when you are instructed to do so.

6. Each circuit part in an electronic kit has its own component number (R2, C4, etc.). Use these numbers when you want to identify the same part in the various sections of the Manual. These numbers, which are especially useful if a part has to be replaced, appear:

   — In the Parts List,

   — At the beginning of each step where a component is installed,

   — In some illustrations,

   — In the Schematic,

   — In the section at the rear of the Manual.

7. When you are instructed to cut something to a particular length, use the scales (rulers) provided at the bottom of the Manual pages.

SAFETY WARNING: Avoid eye injury when you cut off excess lead lengths. Hold the leads so they cannot fly toward your eyes.

SOLDERING

Soldering is one of the most important operations you will perform while assembling your kit. A good solder connection will form an electrical connection between two parts, such as a component lead and a circuit board foil. A bad solder connection could prevent an otherwise well-assembled kit from operating properly.

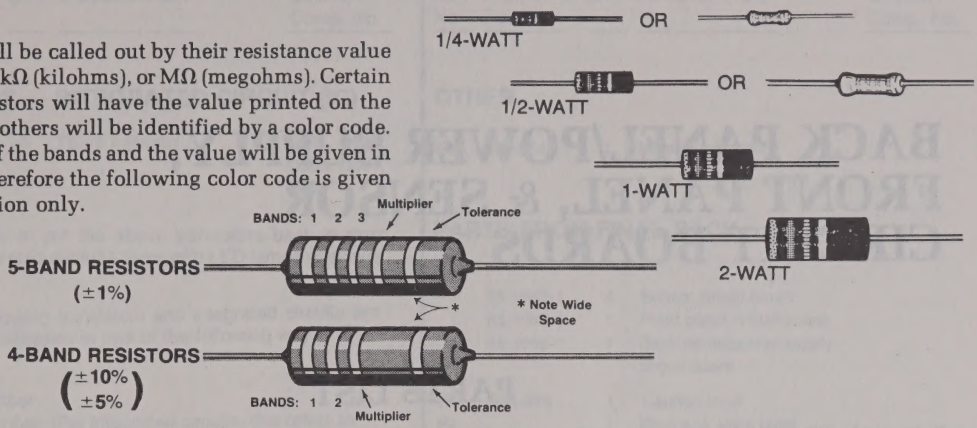
It is easy to make a good solder connection if you follow a few simple rules:

1. Use the right type of soldering iron. A 25 to 40-watt pencil soldering iron with a 1/8″ or 3/16″ chisel or pyramid tip works best.

2. Keep the soldering iron tip clean. Wipe it often on a wet sponge or cloth; then apply solder to the tip to give the entire tip a wet look. This process is called tinning, and it will protect the tip and enable you to make good connections. When solder tends to "ball" or does not stick to the tip, the tip needs to be cleaned and retinned.

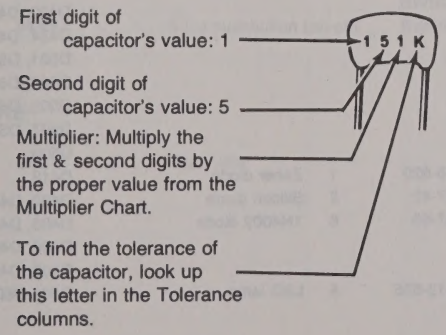
PARTS

Resistors will be called out by their resistance value in Ω (ohms), kΩ (kilohms), or MΩ (megohms). Certain types of resistors will have the value printed on the body, while others will be identified by a color code. The colors of the bands and the value will be given in the steps, therefore the following color code is given for information only.



Band 1 1st Digit		Band 2 2nd Digit		Band 3 (if used) 3rd Digit		Multiplier		Resistance Tolerance	
Color	Digit	Color	Digit	Color	Digit	Color	Multiplier	Color	Tolerance
Black	0	Black	0	Black	0	Black	1	Silver	±10%
Brown	1	Brown	1	Brown	1	Brown	10	Gold	± 5%
Red	2	Red	2	Red	2	Red	100	Brown	± 1%
Orange	3	Orange	3	Orange	3	Orange	1,000		
Yellow	4	Yellow	4	Yellow	4	Yellow	10,000		
Green	5	Green	5	Green	5	Green	100,000		
Blue	6	Blue	6	Blue	6	Blue	1,000,000		
Violet	7	Violet	7	Violet	7	Silver	0.01		
Gray	8	Gray	8	Gray	8	Gold	0.1		
White	9	White	9	White	9				

Capacitors will be called out by their capacitance value in μF (microfarads) or pF (picofarads) and type: ceramic, Mylar*, electrolytic, etc. Some capacitors may have their value printed in the following manner:


First digit of capacitor's value: 1
Second digit of capacitor's value: 5
Multiplier: Multiply the first & second digits by the proper value from the Multiplier Chart.
To find the tolerance of the capacitor, look up this letter in the Tolerance columns.
1 5 1 K

EXAMPLES:

151K = 15 × 10 = 150 pF
759 = 75 ×0.1 = 7.5 pF

NOTE: The letter "R" may be used at times to signify a decimal point: as in: 2R2 = 2.2 (pF or μF).

MULTIPLIER		TOLERANCE OF CAPACITOR		
FOR THE NUMBER:	MULTIPLY BY:	10 pF OR LESS	LETTER	OVER 10 pF
0	1	±0.1 pF	B	
1	10	±0.25 pF	C	
2	100	±0.5 pF	D	
3	1000	±1.0 pF	F	±1%
4	10,000	±2.0 pF	G	±2%
5	100,000		H	±3%
			J	±5%
8	0.01		K	±10%
9	0.1		M	±20%

*DuPont Registered Trademark

BACK PANEL/POWER SUPPLY, FRONT PANEL, & SENSOR CIRCUIT BOARDS

PARTS LIST

Refer to the "Pack Index Sheet," and locate Pack #1. Remove Pack #1 and check each part against the following list and Parts Pictorial #1 (Illustration Booklet, Page 1). Any part that is packed in an individual envelope with the part number on it should be placed back in the envelope after you identify it until it is called for in a step. Do not discard any packing materials until all parts are accounted for.

To order a replacement part, always include the Part Number and use the Parts Order Form furnished with this kit. If a Parts Order Form is not available, use one of the "Expedited Parts Order Forms" at the rear of this Manual, or refer to "Replacement Parts" inside the rear cover. Your Warranty is inside the front cover. For pricing information, refer to the separate "Heath Parts Price List."

KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.
RESISTORS, 1/4-Watt, 5% (last band gold)				
NOTE: The resistors may be packed in more than one envelope. Open all the resistor envelopes in this pack before you check them against the Parts List.				
A1	6-391-12	1	390 Ω (orange-white-brown)	R404
A1	6-103-12	5	10 kΩ (brown-black-orange)	R403, R405, R406, R407, R409
A1	6-473-12	1	47 kΩ (yellow-violet-orange)	R408
A1	6-104-12	2	100 kΩ (brown-black-yellow)	R401, R402
CAPACITORS				
B1	27-47	5	.1 μF Mylar	C401, C402, C404, C406, C408
B2	25-924	1	2.2 μF electrolytic	C412
B2	25-917	5	10 μF electrolytic	C403, C405, C407, C409, C411

KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.
DIODES — LED's				
C1	56-56	23	1N4149 diode	D401, D411 D412, D414, D415, D416, D417, D418, E419, D421, D422, D423, D424, D425, D501, D502, D503, D504 D505, D506, D507, D508, D509
C1	56-620	1	Zener diode	D413
C1	57-42	2	Silicon diode	D402, D404
C1	57-65	6	1N4002 diode	D403, D405, D406, D407, D408, D409
C2	412-635	5	LED lamp	D601-D605

NOTE: Be sure to put these LED lamps back in their envelope. You could confuse them with transistors of similar appearance.

HEATHKIT®

KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.

TRANSISTORS — INTEGRATED CIRCUIT (IC)

D1	417-919	5	TIL-78 transistor	Q601, Q602, Q603, Q604, Q605

NOTE: Be sure to put the above transistors back in their envelope. You could confuse them with LED lamps of similar appearance.

NOTE: The following transistors and integrated circuits are marked for identification in one of the following ways:

1. Part number.
2. Type number. (For integrated circuits, this refers to the numbers, the letters may be different or missing.)
3. Part number and type number.
4. Part number with a type number other than the one listed.

D2	417-801	3	MPSA20 transistor	Q401, Q403, Q404
D3	442-54	1	UA7805 IC	U402

SWITCHES

E1	60-612	1	8-lug slide	SW401
E2	60-21	6	6-lug slide	SW402, SW403, SW404, SW405, SW408, SW409
E2	60-72	2	6-lug slide (spring return)	SW406 SW407
E3	64-684	8	6-lug pushbutton (spring return)	SW501, SW502, SW503, SW504, SW505, SW506 SW507, SW508,
E3	64-683	1	6-lug pushbutton (on-off)	SW509

WIRE

	340-8	6"	Bare wire

KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.

OTHER

E4	406-664	1	Magnifying glass

PARTS FROM FINAL PACK

	85-1982-1	4	Sensor circuit board
	85-1969-1	1	Front panel circuit board
	85-1968-1	1	Back panel/power supply circuit board
F1	390-926	1	Caution label
F2		1	Blue and white label
	597-260	1	Parts Order Form
			Solder
		1	Assembly Manual (See title page for Part Number.)
		1	Operation Manual (See title page for Part Number.)

ADDITIONAL PARTS TO BE PURCHASED

Cable

You will have to purchase an 8-wire cable that will connect the wind sensor assembly to the Digital Weather Computer. First determine the length of the cable by reading the information under "Wind Sensor Assembly" on Page 12 of the Operation Manual. You can obtain this cable from the Heath Company in 50′, 100′, and 150′ rolls. The model numbers are listed below.

50′	IDA1290-1
100′	IDA1290-2
150′	IDA1290-3

BATTERY

You should also purchase, at this time, the optional 6.2V to 14.8V battery described in the Introduction on Page 3.

STEP-BY-STEP ASSEMBLY

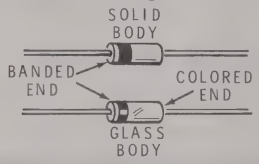
Back Panel/Power Supply

START

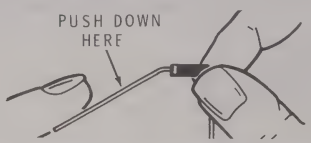
( ) Position the back panel/power supply circuit board as shown with the printed side up.

In the following steps, you will be given detailed instructions on how to install and solder the first part on the circuit board. Read and perform each step carefully. Then use the same procedure whenever you install parts on a circuit board.

If your diode has a solid body, the band is clearly defined. If your diode has a glass body, do not mistake the colored end **inside** the diode for the banded end. Look for a band painted on the **outside** of the glass.

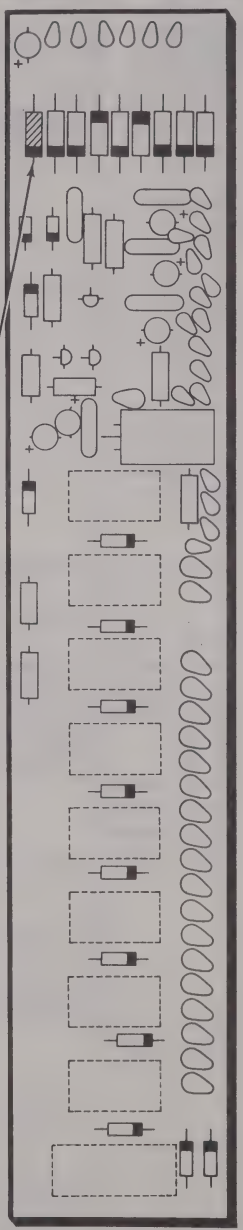


( ) D405: 1N4002 diode (#57-65). Hold the diode by the body as shown and bend the leads straight down.



( ) Position the end with the band as shown. Push the leads through the holes at the proper location on the circuit board.

( ) Position the diode against the circuit board. Then bend the leads outward slightly to hold the diode in place.

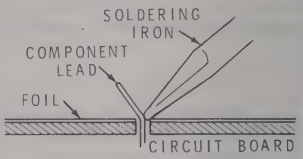


PICTORIAL 1-1

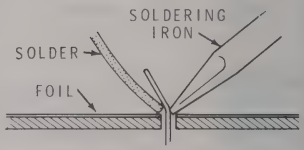
CONTINUE

( ) Turn the circuit board over, and solder the diode leads to the circuit board as follows:

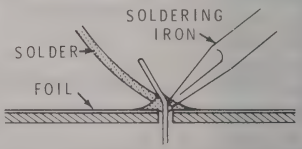
1. Push the soldering iron tip against both the lead and the circuit board foil. Heat **both** for two or three seconds.



2. Then apply solder to the other side of the connection. IMPORTANT: Let the heated lead and the circuit board foil melt the solder.



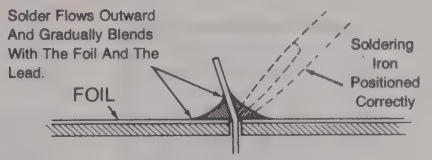
3. As the solder begins to melt, allow it to flow around the connection. Then remove the solder and the iron and let the connection cool.



( ) Cut off the excess lead lengths close to the connection. WARNING: Clip the leads so the ends will not fly toward your eyes.

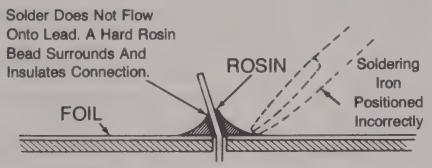
( ) Check the connection. Compare it to the illustrations on Page 11. After you have checked the solder connections, proceed with the assembly on Page 12. Use the same soldering procedure for each connection.

A GOOD SOLDER CONNECTION

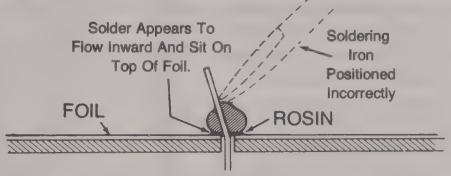


When you heat the lead and the circuit board foil at the same time, the solder will flow evenly onto the lead and the foil. The solder will make a good electrical connection between the lead and the foil.

POOR SOLDER CONNECTIONS


Solder Does Not Flow Onto Lead. A Hard Rosin Bead Surrounds And Insulates Connection.
ROSIN
Soldering Iron Positioned Incorrectly
FOIL

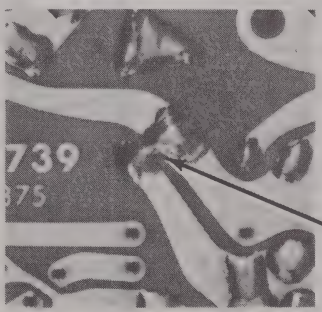
When the lead is not heated sufficiently, the solder will not flow onto the lead as shown above. To correct, reheat the connection and, if necessary, apply a small amount of additional solder to obtain a good connection.



When the foil is not heated sufficiently the solder will blob on the circuit board as shown above. To correct, reheat the connection and, if necessary, apply a small amount of additional solder to obtain a good connection.

SOLDER BRIDGES

A solder bridge between two adjacent foils is shown in photograph **A**. Photograph **B** shows how the connection should appear. A solder bridge may occur if you accidentally touch an adjacent previously soldered connection, if you use too much solder, or if you "drag" the soldering iron across other foils as you remove it from the connection. A good rule to follow is: always take a good look at the foil area around each lead before you solder it. Then, when you solder the connection, make sure the solder remains in this area and does not bridge to another foil. This is especially important when the foils are small and close together. NOTE: It is alright for solder to bridge two connections on the same foil.

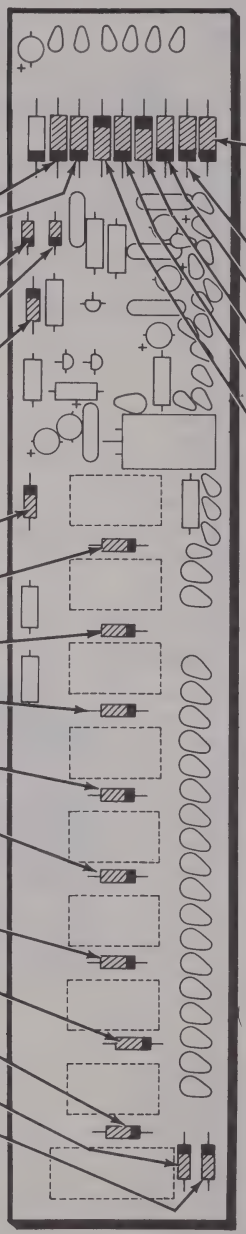


A

SOLDER BRIDGE

B

Use only enough solder to make a good connection, and lift the soldering iron straight up from the circuit board. If a solder bridge should develop, turn the circuit board foil-side-down and heat the solder between connections. The excess solder will run onto the tip of the soldering iron, and this will remove the solder bridge. NOTE: The foil side of most circuit boards has a coating on it called "solder resist." This is a protective insulation to help prevent solder bridges.



START

NOTE: Make sure you installed the first part in Pictorial 1-1.

( ) D403: 1N4002 (#57-65).

( ) D401: 1N4149 (#56-56).

( ) D411: 1N4149 (#56-56).

( ) D412: 1N4149 (#56-56).

( ) D413: Zener (#56-620).

( ) Solder the leads to the foil and cut off the excess lead lengths.

( ) D414: 1N4149 (#56-56).

( ) D425: 1N4149 (#56-56).

( ) D424: 1N4149 (#56-56).

( ) D423: 1N4149 (#56-56).

( ) D422: 1N4149 (#56-56).

( ) D421: 1N4149 (#56-56).

( ) Solder the leads to the foil and cut off the excess lead lengths.

( ) D419: 1N4149 (#56-56).

( ) D418: 1N4149 (#56-56).

( ) D417: 1N4149 (#56-56).

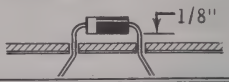
( ) D415: 1N4149 (#56-56).

( ) D416: 1N4149 (#56-56).

( ) Solder the leads to the foil and cut off the excess lead lengths.

CONTINUE

( ) D402: Silicon (#57-42). Position this diode 1/8" above the circuit board.



( ) D404: Silicon (#57-42). Position the diode 1/8" above the circuit board.

( ) D406: 1N4002 (#57-65).

( ) D407: 1N4002 (#57-65).

( ) D408: 1N4002 (#57-65).

( ) D409: 1N4002 (#57-65).

( ) Solder the leads to the foil and cut off the excess lead lengths.

PICTORIAL 1-2

START

( ) R401: 100 kΩ (brown-black-yellow).

( ) R402: 100 kΩ (brown-black-yellow).

( ) R405: 10 kΩ (brown-black-orange).

( ) R406: 10 kΩ (brown-black-orange).

( ) R407: 10 kΩ (brown-black-orange).

( ) R404: 390 Ω (orange-white-brown).

( ) R403: 10 kΩ (brown-black-orange).

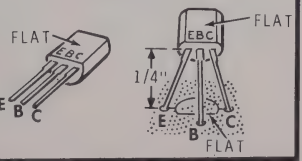
( ) R409: 10 kΩ (brown-black-orange).

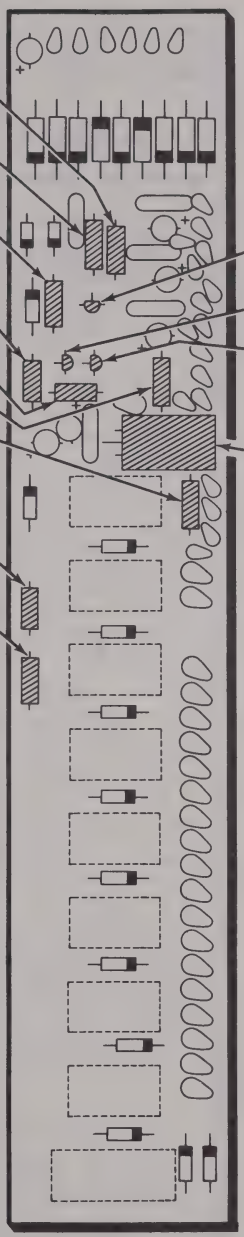
( ) R408: 47 kΩ (yellow-violet-orange).

( ) Solder the leads to the foil and cut off the excess lead lengths.

NOTE: In the following steps, install each of the transistors as follows:

1. Refer to the illustration example below and identify the E, B, and C leads of the transistor.
2. Bend the B lead of each transistor **toward the flat**.
3. Insert the transistor leads into the corresponding E, B, and C holes in the circuit board.
4. Position the transistor approximately 1/4" above the circuit board.
5. Turn the circuit board over, solder the leads to the foil, and cut off the excess lead lengths.





PICTORIAL 1-3

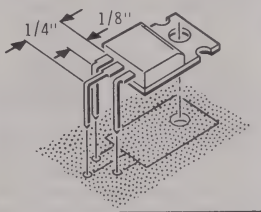
CONTINUE

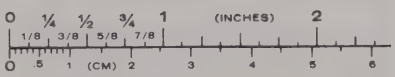
( ) Q401: MPSA20 (#417-801).

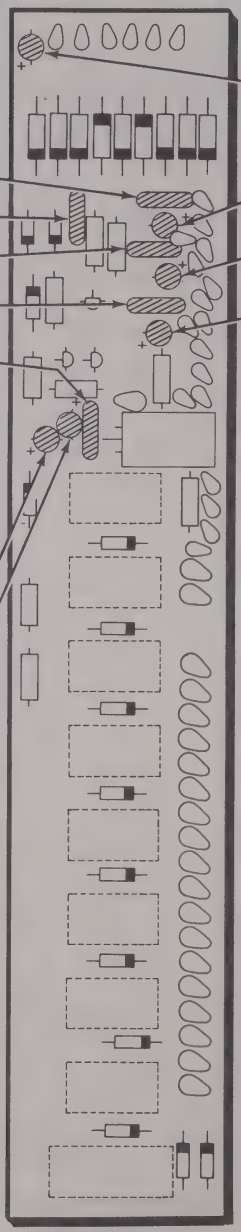
( ) Q403: MPSA20 (#417-801).

( ) Q404: MPSA20 (#417-801).

( ) U402: UA7805 (#442-54). Position the IC with the metal side down. Hold the IC leads with a pair of long-nose pliers. Then bend the leads at a 90° angle to the dimensions shown. Insert the leads into the circuit board, solder the leads to the foil, and cut off the excess lengths. Be sure to line up the hole in the IC with the hole in the circuit board.







START

( ) C402: .1 μF Mylar.

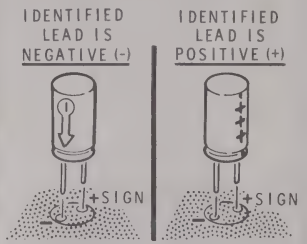
( ) C401: .1 μF Mylar.

( ) C406: .1 μF Mylar.

( ) C408: .1 μF Mylar.

( ) C404: .1 μF Mylar.

CAUTION: Before you install an electrolytic capacitor, note the polarity (+ or −) of the identified lead. Always connect the positive (+) lead to the positive (+) marked point on the circuit board.



( ) C412: 2.2 μF electrolytic.

( ) C405: 10 μF electrolytic.

( ) Solder the leads to the foil and cut off the excess lead lenghts.

CONTINUE

( ) C411: 10 μF electrolytic.

( ) C403: 10 μF electrolytic.

( ) C407: 10 μF electrolytic.

( ) C409: 10 μF electrolytic.

( ) Solder the leads to the foil and cut off the excess lead lengths.

PICTORIAL 1-4

START

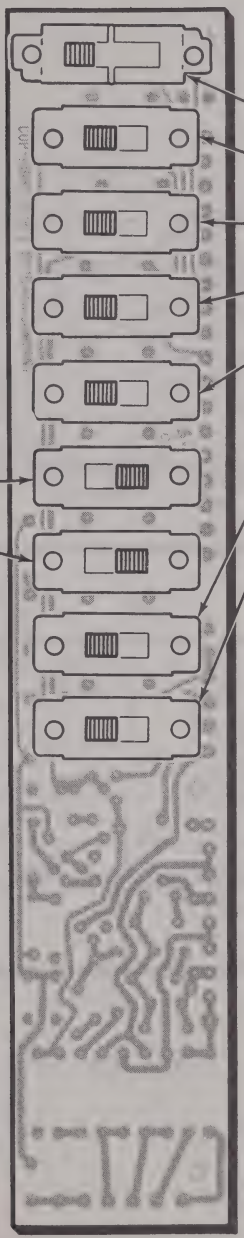
( ) Turn the circuit board over with its **component side down** and position it as shown.

( ) Locate the two 6-lug slide switches (spring return #60-72).

NOTE: When you install each of the next two switches, make sure the slide is toward the right as shown. Insert the lugs and push the switch against the board. Then turn the board over and solder the lugs to the foil on the component side of the board.

( ) SW406: 6-lug (spring return).

( ) SW407: 6-lug (spring return).



PICTORIAL 1-5

CONTINUE

NOTE: The remaining slide switches are symmetrical and can be installed in either direction.

( ) SW401: 8-lug.

( ) SW402: 6-lug.

( ) SW403: 6-lug.

( ) SW404: 6-lug.

( ) SW405: 6-lug.

( ) SW408: 6-lug.

( ) SW409: 6-lug.

CIRCUIT BOARD CHECKOUT

It is important that the following checkout procedure be done after each circuit board is completed.

Visual Inspection

Carefully inspect the foil side of the circuit board for the following most commonly made errors.

( ) Unsoldered connections.

( ) Poor solder connections.

( ) Solder bridges between foil patterns.

( ) Protruding leads which could touch together.

( ) Solder bridges between foil patterns and switch cases.

When making the following visual checks, refer to the Pictorial where the part was installed and check it against the installation instructions.

( ) Check the transistors for proper installation.

( ) Check the tantalum electrolytic capacitors for the correct position of the positive (+) mark.

( ) Check the diodes for proper installation.

Set the circuit board aside.

FINISH

Sensor Circuit Boards

START

( ) Locate one of the sensor circuit boards and position it component side up as shown below.

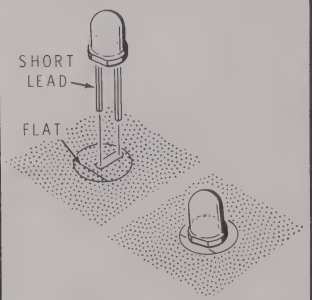
( ) Note the rectangular area near the top of the board. Write the letters WVB (wind vane bottom) in this area with a ball point pen. These letters are used later in the assembly for reference to install the board in its housing.

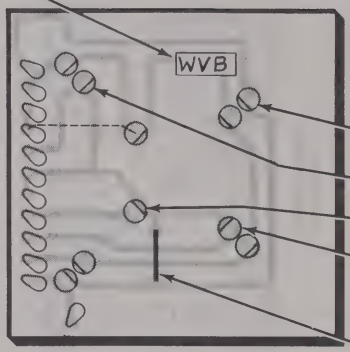
Install each of the following transistors and diodes in the following manner:

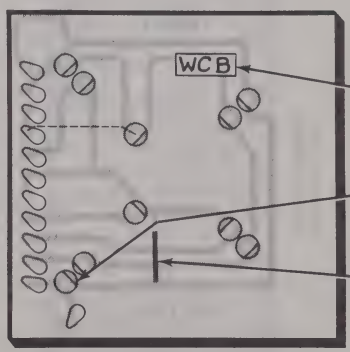
1. Insert the leads into the slot with the short lead near the outline of the flat on the board. The short lead **must** be next to the flat or the device will not work.

2. Insert the leads **all the way so the part is flush against the board. Do not bend** the leads, but hold the part firmly against the board for soldering.

3. Be careful not to use too much heat when you solder the leads to the foil. Then clip off the excess lead length and proceed to the next step.







CONTINUE

Remove the five TIL-78 transistors (#417-919) from their envelope and install them in the following steps.

( ) Q604.

( ) Q605.

( ) Q602.

( ) Q603.

( ) Install a 3/4" bare wire, solder the wire to the foil, and cut off the excess lead length. Make sure the wire is flush against the board.

Set the circuit board aside.

( ) Locate another sensor circuit board and write the letters WCB (wind cup bottom) in the rectangle.

( ) Q601: TIL-78 transistor (#417-919).

( ) Install a 3/4" bare wire, solder the wire to the foil, and cut off the excess length. Make sure the wire is flush against the board.

Set the circuit board aside.

PICTORIAL 1-6

START

( ) Locate another sensor circuit board and write the letters WVT (wind vane top) in the rectangle.

( ) 1/4" bare wire between foils at D601. Solder the wire to the foil and cut off the excess wire lengths.

NOTE: Install the following TIL-32 (#412-635) LED lamps as you did the transistors on the two previous circuit boards.

( ) D602 .....

( ) D603 .....

( ) D604 .....

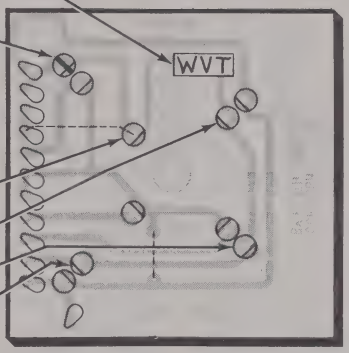
( ) D605 .....

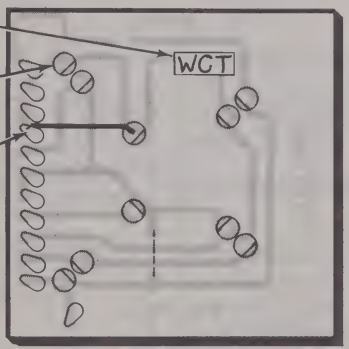
Set the circuit board aside.

( ) Write the letters WCT (wind cup top) in the rectangle on the remaining sensor circuit board.

( ) D601 .....

( ) 1-3/8" bare wire between the indicated foil of D602 and hole G. See the inset drawing below. Solder the wire to the foil and cut off the excess length.





PICTORIAL 1-7

CONTINUE

CIRCUIT BOARD CHECKOUT

Carefully inspect the four sensor circuit boards for the following conditions.

( ) Unsoldered connections.

( ) Poor solder connections.

( ) Solder bridges between foil patterns.

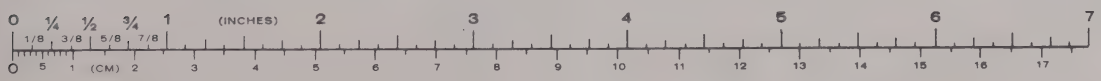
( ) Protruding leads which could touch together.

( ) Transistors for the proper installation.

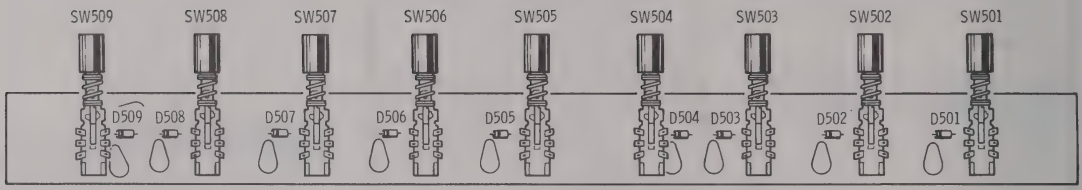
( ) LED's for the proper installation.

Set aside the remaining length of bare wire, it will be used later.

FINISH



Front Panel Circuit Board



PICTORIAL 1-8

Refer to Pictorial 1-8 for the following steps.

( ) Position the front panel circuit board with the printed side up as shown.

In the following step you will install nine 1N4149 (#56-56) diodes. Be sure to match the band on the diode with the band on the circuit board. Solder the leads to the foil and cut off the excess lead lengths.

( ) Install the diodes at locations D501 through D509.

NOTE: When you solder the lugs of the following switches to the foil, it is very important that the switches are flush against the circuit board. This is to make sure the knobs will not bind in the control panel holes when the circuit board is mounted later.

( ) Locate the one 6-lug pushbutton switch (on-off) #64-683. Install the switch at location SW509.

( ) Similarly install the eight 6-lug pushbutton switches (spring return) at locations SW501 through SW508.

CIRCUIT BOARD CHECKOUT

Carefully inspect the circuit board for the following conditions.

( ) Unsoldered connections.

( ) Poor solder connections.

( ) Solder bridges between foil patterns.

( ) Protruding leads which could touch together.

( ) Diodes for the correct position of the banded end.

DISPLAY CIRCUIT BOARD

PARTS LIST

Refer to the "Pack Index Sheet," and locate Pack #2. Remove Pack #2 and check each part against the following list and Parts Pictorial #2 (Illustration Booklet, Page 1). Any part that is packed in an individual envelope with the part number on it should be placed back in the envelope after you identify it until it is called for in a step. Do not discard any packing materials until all parts are accounted for.

To order a replacement part, always include the Part Number and use the Parts Order Form furnished with this kit. If a Parts Order Form is not available, use one of the "Expedited Parts Order Forms" at the rear of this Manual, or refer to "Replacement Parts" inside the rear cover. Your Warranty is inside the front cover. For pricing information, refer to the separate "Heath Parts Price List."

RESISTORS, 5% (last band gold)

NOTE: The resistors may be packed in more than one envelope. Open all the resistor envelopes in this pack before you check them against the Parts List.

1/4-Watt

KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.
A1	6-101-12	16	100 Ω (brown-black-brown)	R138, R136, R137, R139, R141, R142, R143, R144, R145, R146, R147, R148, R149, R151, R152, R153
A1	6-271-12	8	270 Ω (red-violet-brown)	R118, R119, R121, R122, R123, R124, R125, R126
A1	6-331-12	6	330 Ω (orange-orange-brown)	R102, R103, R104, R105, R107, R108

Resistors (cont'd.)

KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.
A1	6-222-12	8	2200 Ω (red-red-red)	R109, R111, R112, R113, R114, R115, R116, R117
A1	6-472-12	5	4700 Ω (yellow-violet-red)	R156, R159, R163, R166, R169
A1	6-103-12	10	10 kΩ (brown-black-orange)	R154, R155, R157, R158 R161, R162, R164, R165, R167, R168

1/2-Watt

KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.
B1	6-150	10	15 Ω (brown-green-black)	R101, R106, R127, R128, R129, R131, R132, R133, R134, R135

KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.
CAPACITORS				
C1	21-23	4	420 pF ceramic	C101, C102, C103, C104
TRANSISTORS — INTEGRATED CIRCUIT (IC)				

NOTE: Transistors and integrated circuits are marked for identification in one of the following four ways:

1. Part Number.
2. Type number. (For integrated circuits, this refers to the numbers, the letters may be different or missing.)
3. Part number and type number.
4. Part number with a type number other than the one listed.

D1	417-235	8	2N4121 transistor	Q116, Q118, Q121, Q123, Q125, Q127, Q129, Q132,
D1	417-801	13	MPSA20 transistor	Q117, Q119, Q122, Q124, Q126, Q128, Q131, Q133, Q134, Q135, Q136, Q137, Q138
D1	417-881	15	MPSA13 transistor	Q101, Q102, Q103, Q104, Q105, Q106, Q107, Q108, Q109, Q110, Q111, Q112, Q113, Q114, Q115
D2	443-87	2	SN74145N IC	U102, U103

NOTE: Do not open the following IC package until instructed to do so.

D3	443-871	1	MC14514 IC	U101
LED's				
E1	412-634	16	Large lamp	D115, D116, D117, D118, D119, D121, D122, D123, D124, D125, D126, D127, D128, D129 D131, D132
E2	412-633	13	Small lamp	D101, D102, D103, D104, D105, D106, D107, D108, D109, D112, D111, D113, D114
E3	411-834	1	Display (+1)	DS108,
E4	411-835	14	Display (8)	DS101, DS102, DS103, DS104, DS105, DS106, DS107, DS109, DS110, DS111, DS112, DS113, DS114, DS115
HARDWARE				
F1	250-56	6	6-32 × 1/4" screw	
F2	255-185	2	6-32 × 7/16" spacer	
SOCKETS				
G1	434-307	1	24-pin IC socket	
G2	434-299	2	16-pin IC socket	
G2	434-298	15	14-pin display socket	
G3	432-1009	3	14-pin plug	P203, P204, P205
G4	266-968	1	Alignment ring	
ITEM FROM FINAL PACK				
	85-1955-1	1	Display circuit board	
G5	214-207	1	Display housing	
G6	446-682	1	Display window	

STEP-BY-STEP ASSEMBLY

IDENTIFICATION DRAWING

The steps performed in this Pictorial are in this area of the circuit board.

START

Position the display circuit board as shown. In the following Pictorials you will be working with either the left half or the right half of the circuit board. In this Pictorial you are working with the left half. See the Identification Drawing.

( ) R104: 330 Ω (orange-orange-brown).

( ) R105: 330 Ω (orange-orange-brown).

( ) R137: 100 Ω (brown-black-brown).

( ) R138: 100 Ω (brown-black-brown).

( ) R136: 100 Ω (brown-black-brown).

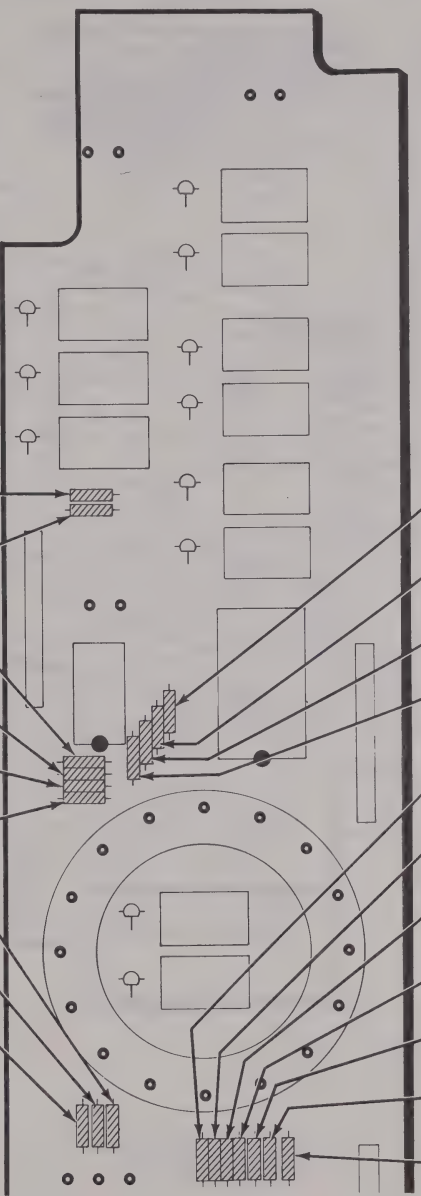
( ) R139: 100 Ω (brown-black-brown).

( ) R106: 15 Ω (brown-green-black).

( ) R107: 330 Ω (orange-orange-brown).

( ) R108: 330 Ω (orange-orange-brown).

( ) Solder the leads to the foil and cut off the excess lead lengths.



CONTINUE

( ) R141: 100 Ω (brown-black-brown).

( ) R142: 100 Ω (brown-black-brown).

( ) R143: 100 Ω (brown-black-brown).

( ) R144: 100 Ω (brown-black-brown).

( ) R145: 100 Ω (brown-black-brown).

( ) R148: 100 Ω (brown-black-brown).

( ) R147: 100 Ω (brown-black-brown).

( ) R146: 100 Ω (brown-black-brown).

( ) R151: 100 Ω (brown-black-brown).

( ) R149: 100 Ω (brown-black-brown).

( ) R153: 100 Ω (brown-black-brown).

( ) Solder the leads to the foil and cut off the excess lead lengths.

PICTORIAL 2-1

IDENTIFICATION
DRAWING

The steps performed in this Pictorial are in this area of the circuit board.

START

You will be working with the right half of the circuit board in this Pictorial.

( ) R155: 10 kΩ (brown-black-orange).

( ) R154: 10 kΩ (brown-black-orange).

( ) R165: 10 kΩ (brown-black-orange).

( ) R164: 10 kΩ (brown-black-orange).

( ) R162: 10 kΩ (brown-black-orange).

( ) R161: 10 kΩ (brown-black-orange).

( ) Solder the leads to the foil and cut off the excess lead lengths.

( ) R158: 10 kΩ (brown-black-orange).

( ) R157: 10 kΩ (brown-black-orange).

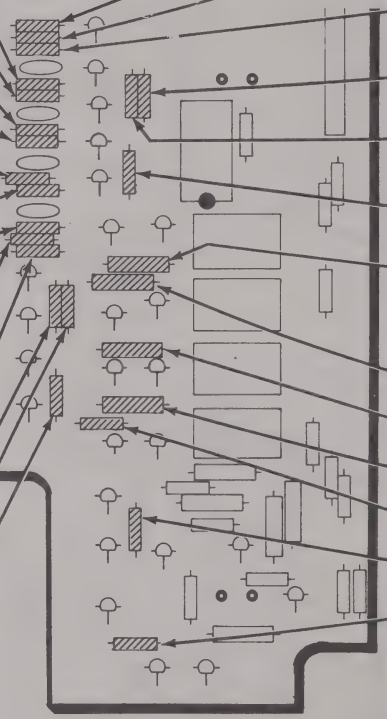
( ) R159: 4700 Ω (yellow-violet-red).

( ) R123: 270 Ω (red-violet-brown).

( ) R122: 270 Ω (red-violet-brown).

( ) R121: 270 Ω (red-violet-brown).

( ) Solder the leads to the foil and cut off the excess lead lengths.



CONTINUE

( ) R156: 4700 Ω (yellow-violet-red).

( ) R168: 10 kΩ (brown-black-orange).

( ) R167: 10 kΩ (brown-black-orange).

( ) R169: 4700 Ω (yellow-violet-red).

( ) R166: 4700 Ω (yellow-violet-red).

( ) R163: 4700 Ω (yellow-violet-red).

( ) R131: 15 Ω (brown-green-black).

( ) Solder the leads to the foil and cut off the excess lead lengths.

( ) R132: 15 Ω (brown-green-black).

( ) R129: 15 Ω (brown-green-black).

( ) R127: 15 Ω (brown-green-black).

( ) R118: 270 Ω (red-violet-brown).

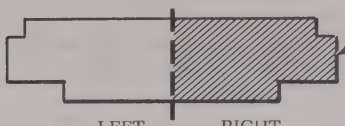
( ) R124: 270 Ω (red-violet-brown).

( ) R126: 270 Ω (red-violet-brown).

( ) Solder the leads to the foil and cut off the excess lead lengths.

PICTORIAL 2-2

IDENTIFICATION DRAWING



The steps performed in this Pictorial are in this area of the circuit board.

START

You will be working with the right half of the circuit board in this Pictorial.

( ) R133: 15 Ω (brown-green-black).

( ) R103: 330 Ω (orange-orange-brown).

( ) R101: 15 Ω (brown-green-black).

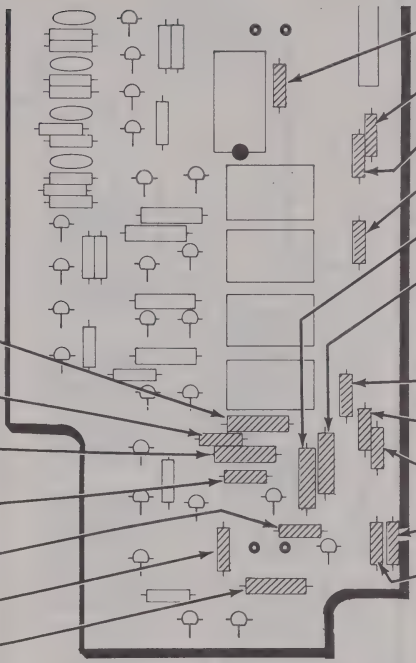
( ) R102: 330 Ω (orange-orange-brown).

( ) R125: 270 Ω (red-violet-brown).

( ) R119: 270 Ω (red-violet-brown).

( ) R135: 15 Ω (brown-green-black).

( ) Solder the leads to the foil and cut off the excess lead lengths.



CONTINUE

( ) R152: 100 Ω (brown-black-brown).

( ) R114: 2200 Ω (red-red-red).

( ) R113: 2200 Ω (red-red-red).

( ) R112: 2200 Ω (red-red-red).

( ) R128: 15 Ω (brown-green-black).

( ) R134: 15 Ω (brown-green-black).

( ) Solder the leads to the foil and cut off the excess lead lengths.

( ) R109: 2200 Ω (red-red-red).

( ) R115: 2200 Ω (red-red-red).

( ) R116: 2200 Ω (red-red-red).

( ) R117: 2200 Ω (red-red-red).

( ) R111: 2200 Ω (red-red-red).

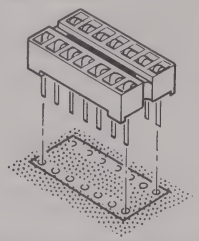
( ) Solder the leads to the foil and cut off the excess lead lengths.

PICTORIAL 2-3

START

You will be working with the left half of the circuit board in this Pictorial.

NOTE: The IC and display sockets that you will install in the following steps can be installed either way in the circuit board. Be sure the pins are straight, insert the pins into the holes, and solder the pins to the foil as you install each socket.



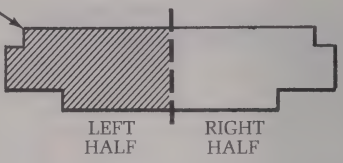
( ) Nine 14-pin display sockets.

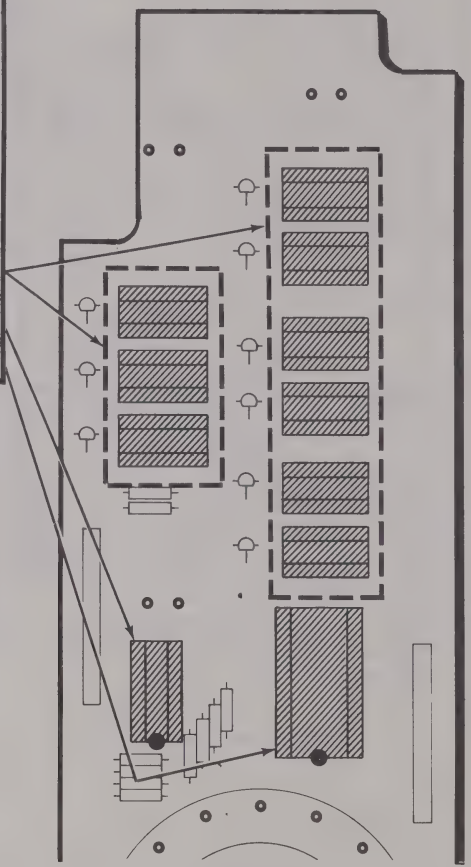
( ) 16-pin IC socket.

( ) 24-pin IC socket.

The steps performed in this Pictorial are in this area of the circuit board.

IDENTIFICATION DRAWING

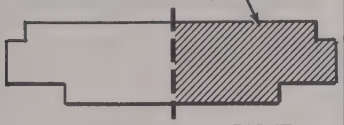




PICTORIAL 2-4

IDENTIFICATION DRAWING

The steps performed in this Pictorial are in this area of the circuit board.



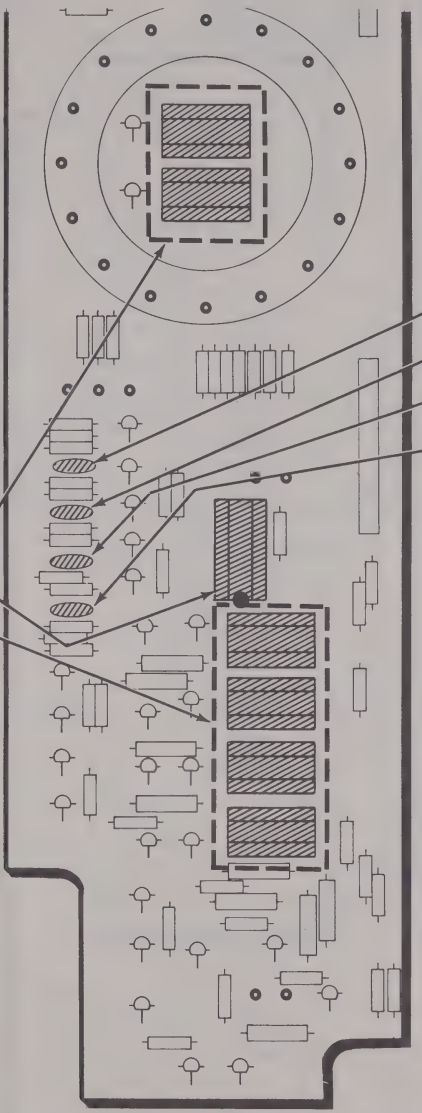
START

You will be working with the right half of the circuit board in this Pictorial.

( ) Two 14-pin display sockets.

( ) 16-pin IC socket.

( ) Four 14-pin display sockets.



CONTINUE

Before you install a disc capacitor, remove from its leads any excess body coating material which could protrude through the circuit board and cause a poor solder connection to the foil.

( ) C101: 420 pF ceramic.

( ) C104: 420 pF ceramic.

( ) C103: 420 pF ceramic.

( ) C102: 420 pF ceramic.

( ) Solder the leads to the foil and cut off the excess lead lengths.

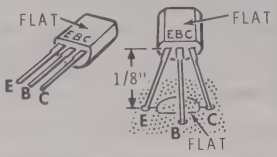
PICTORIAL 2-5

START

You will be working with the left half of the circuit board in this Pictorial.

NOTE: In the following steps, install each of the transistors as follows:

1. Refer to the illustration example below and identify the E, B, and C leads of the transistor.
2. Bend the B lead of each transistor **toward the flat.**
3. Insert the transistor leads into the corresponding E, B, and C holes in the circuit board.
4. **Position the transistor 1/8" or less above the circuit board. This is important for clearance reasons later in assembly.**
5. Turn the circuit board over, solder the leads to the foil, and cut off the excess lead lengths.



Locate eleven MPSA13 transistors (#417-881). Install these transistors at the following locations:

( ) Q108 .....

( ) Q101 .....

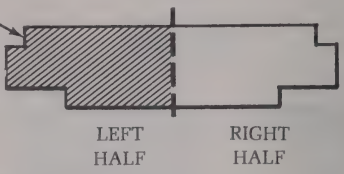
( ) Q109 .....

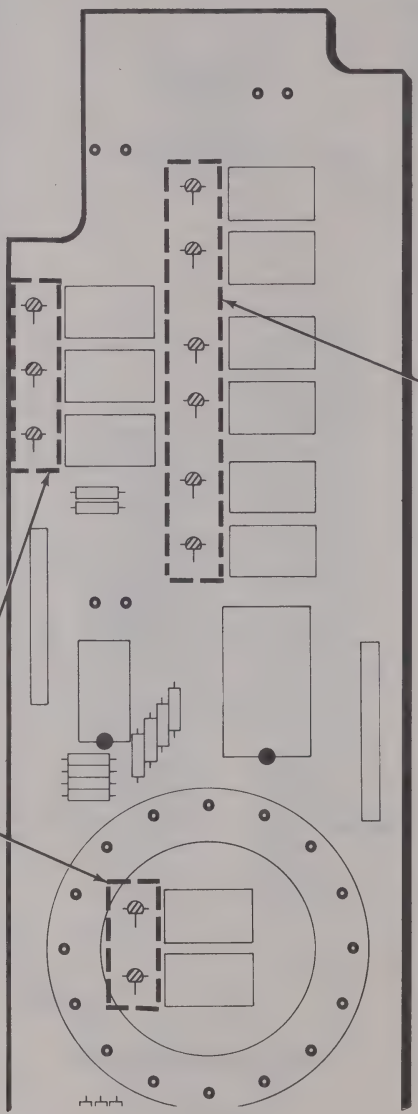
( ) Q104 .....

( ) Q112 .....

The steps performed in this Pictorial are in this area of the circuit board.

IDENTIFICATION DRAWING





CONTINUE

( ) Q105.

( ) Q113.

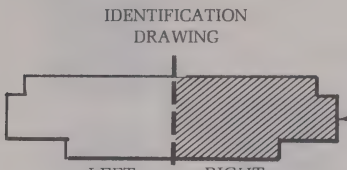
( ) Q106.

( ) Q114.

( ) Q107.

( ) Q115.

PICTORIAL 2-6



START

You will be working with the right half of the circuit board in this Pictorial.

Install five MPSA20 transistors (#417-801) at the following locations:

( ) Q138 .....

( ) Q134 .....

( ) Q137 .....

( ) Q136 .....

( ) Q135 .....

( ) Q125: 2N4121 (#417-235).

( ) Q126: MPSA20 (#417-801).

( ) Q121: 2N4121 (#417-235).

( ) Q122: MPSA20 (#417-801).

( ) Q127: 2N4121 (#417-235).

( ) Q128: MPSA20 (#417-801).

( ) Q132: 2N4121 (#417-235).

( ) Q133: MPSA20 (#417-801).

CONTINUE

( ) Q123: 2N4121 (#417-235).

( ) Q102: MPSA13 (#417-881).

( ) Q124: MPSA20 (#417-801).

( ) Q110: MPSA13 (#417-881).

( ) Q116: 2N4121 (#417-235).

( ) Q103: MPSA13 (#417-881).

( ) Q117: MPSA20 (#417-801).

( ) Q111: MPSA13 (#417-881).

( ) Q118: 2N4121 (#417-235).

( ) Q129: 2N4121 (#417-235).

( ) Q131: MPSA20 (#417-801).

( ) Q119: MPSA20 (#417-801).

PICTORIAL 2-7

HEATHKIT

START

You will be working with the left half of the circuit board in this Pictorial.

To install each of the display LED's, position it so the two dots on one side are toward the left, as shown. Make sure the pins are straight. Then match up the pins with the holes in the socket and install the LED. Be careful that none of the pins bend as you insert them.

( ) DS108: Display (+1).

( ) DS101: Display (8).

( ) DS109: Display (8).

Install eight displays (8) at the following locations.

( ) DS105 .....

( ) DS113 .....

( ) DS106 .....

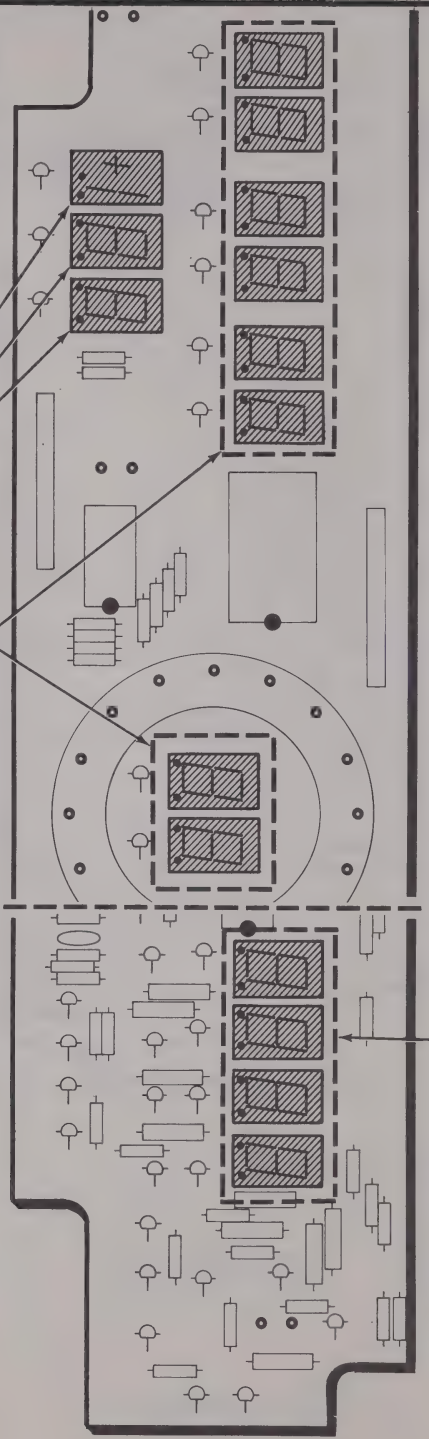
( ) DS114 .....

( ) DS107 .....

( ) DS115 .....

( ) DS104 .....

( ) DS112 .....



CONTINUE

Install four displays (8) on the right side of the circuit board at the following locations.

( ) DS102.

( ) DS110.

( ) DS103.

( ) DS111.

( ) Check the displays to make sure they are all the same height, and that none of them are tilted. Adjust them as necessary by raising or lowering the display.

PICTORIAL 2-8

START

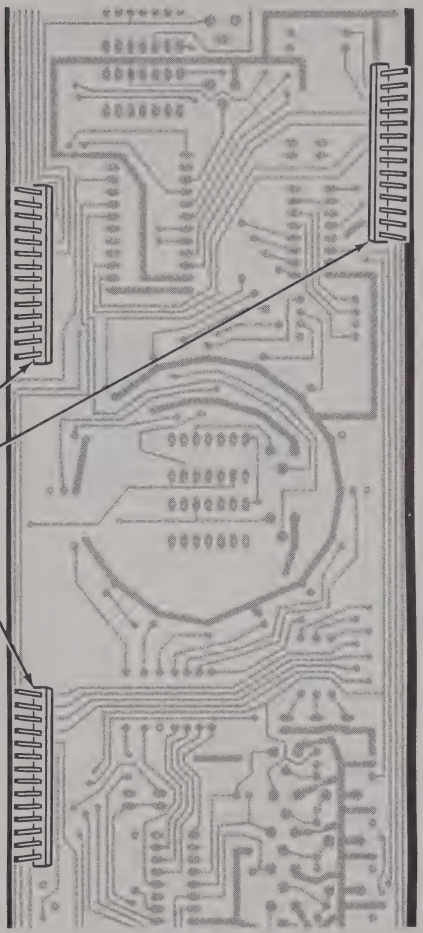
Turn the circuit board over on its component side (foil side up) and position it as shown.

To install the following plugs, insert the short pins into the circuit board holes and solder the lugs to the foil.

( ) P204: 14-pin plug.

( ) P205: 14-pin plug.

( ) P203: 14-pin plug.

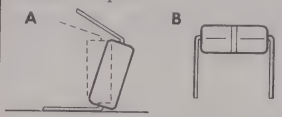


PICTORIAL 2-9

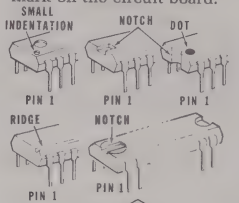
HEATHKIT

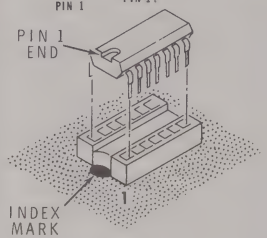
START

Before you install an IC, be sure the pins are straight. Then lay it down on one of its rows of pins, as shown below at A, and roll it over until the pins are at right angles or are bent in slightly as shown at B. Repeat this process for the other row of pins.



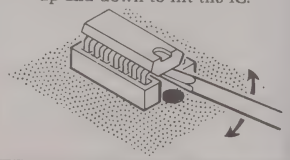
1. To install an IC, position the pin 1 end of the IC over the index mark on the circuit board.





2. Be sure each IC pin is properly started into the socket. Then push the IC down.

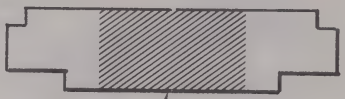
3. Should it ever become necessary to remove an IC, use a screwdriver and insert it beneath the IC; then gently rock it up and down to lift the IC.



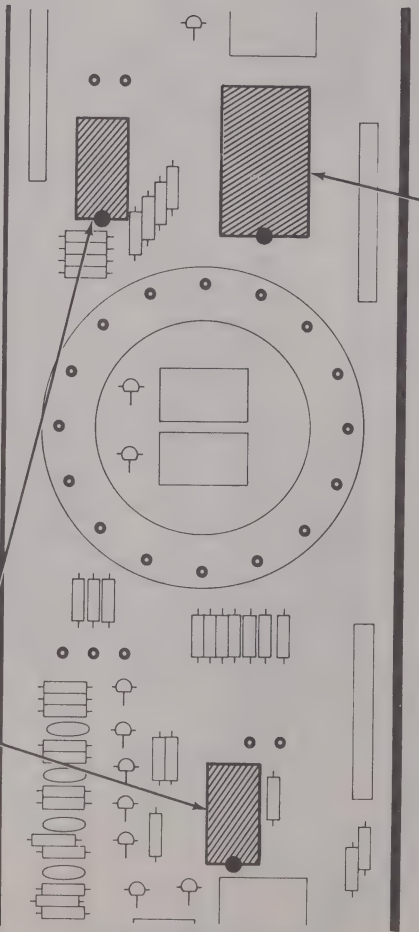
( ) U102: SN74145N (#443-87).

( ) U103: SN74145N (#443-87).

IDENTIFICATION DRAWING



The steps performed in this Pictorial are in this area of the circuit board.



PICTORIAL 2-10

CONTINUE

NOTE: The following IC is packed in conductive foam. This IC is a rugged and reliable component. However, normal static electricity discharged from your body through an IC pin to an object can damage the IC. Install this IC without interruption as follows:

1. Remove the IC from its package with both hands.
2. Hold the IC with one hand and straighten any bent pins with the other hand.
3. Install the IC as before.

( ) U101: MC14514 (#443-871).

CIRCUIT BOARD CHECKOUT

Carefully inspect the circuit board for the following conditions.

( ) Unsoldered connections.

( ) Poor solder connections.

( ) Solder bridges between foil patterns.

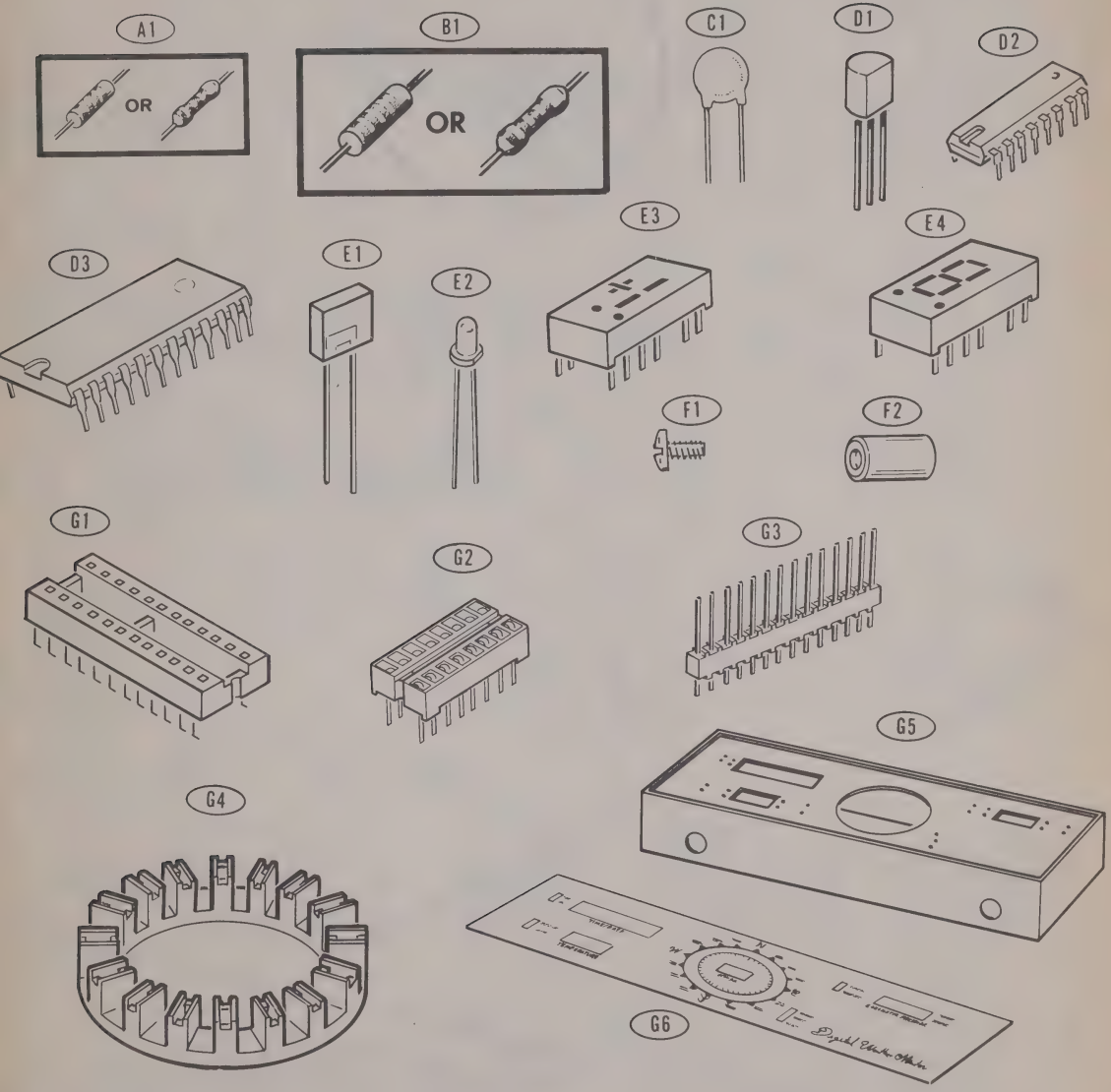
( ) Protruding leads which could touch together.

( ) Transistors for the proper installation.

( ) Display LED's for the proper installation.

Part of 595-1999-06

PARTS PICTORIAL #2



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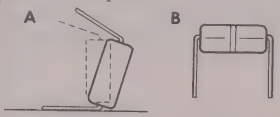
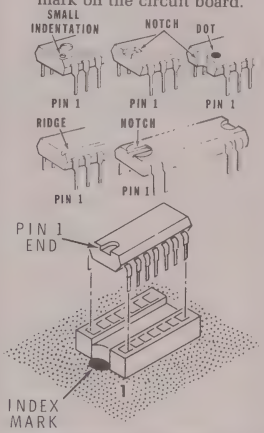
START

Before you install an IC, be sure the pins are straight. Then lay it down on one of its rows of pins, as shown below at A, and roll it over until the pins are at right angles or are bent in slightly as shown at B. Repeat this process for the other row of pins.

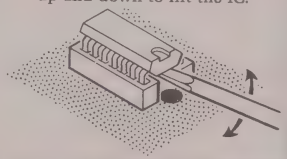


1. To install an IC, position the pin 1 end of the IC over the index mark on the circuit board.



2. Be sure each IC pin is properly started into the socket. Then push the IC down.

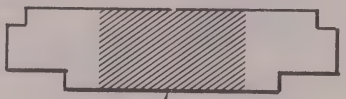
3. Should it ever become necessary to remove an IC, use a screwdriver and insert it beneath the IC; then gently rock it up and down to lift the IC.



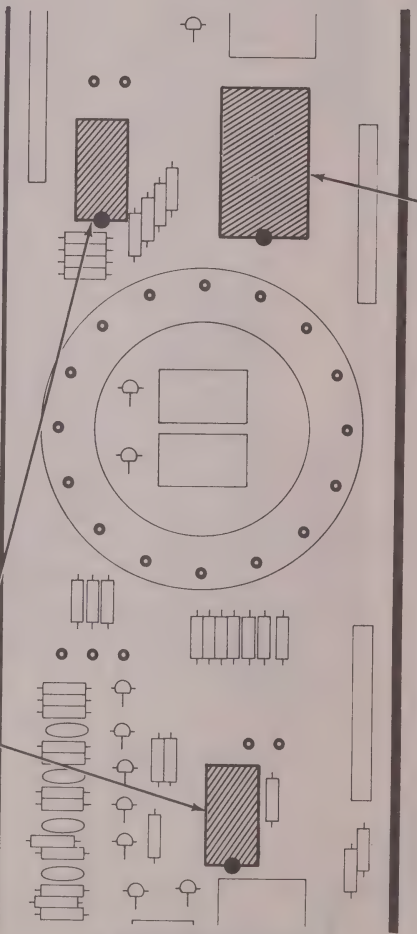
( ) U102: SN74145N (#443-87).

( ) U103: SN74145N (#443-87).

IDENTIFICATION DRAWING



The steps performed in this Pictorial are in this area of the circuit board.



PICTORIAL 2-10

CONTINUE

NOTE: The following IC is packed in conductive foam. This IC is a rugged and reliable component. However, normal static electricity discharged from your body through an IC pin to an object can damage the IC. Install this IC without interruption as follows:

1. Remove the IC from its package with both hands.
2. Hold the IC with one hand and straighten any bent pins with the other hand.
3. Install the IC as before.

( ) U101: MC14514 (#443-871).

CIRCUIT BOARD CHECKOUT

Carefully inspect the circuit board for the following conditions.

( ) Unsoldered connections.

( ) Poor solder connections.

( ) Solder bridges between foil patterns.

( ) Protruding leads which could touch together.

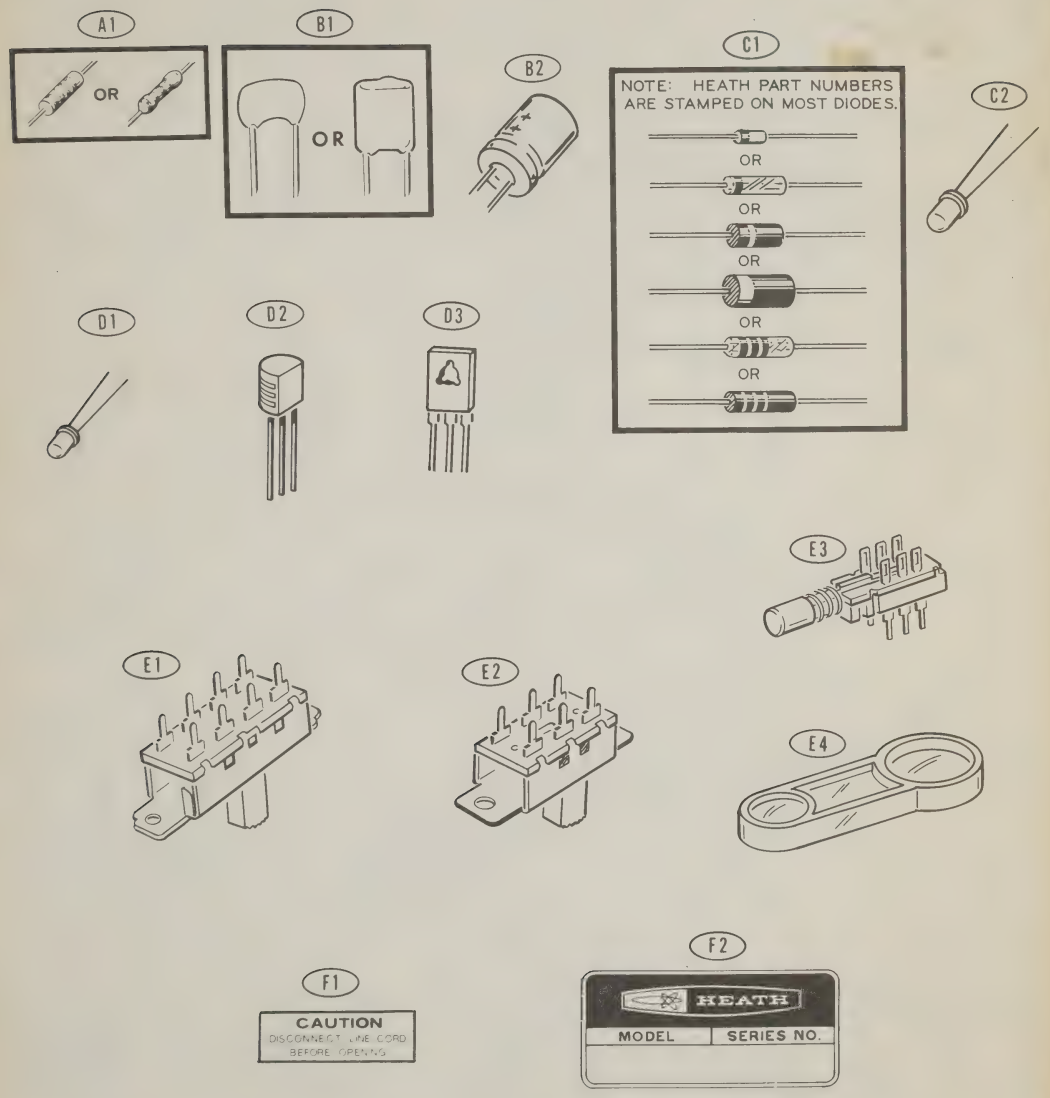
( ) Transistors for the proper installation.

( ) Display LED's for the proper installation.

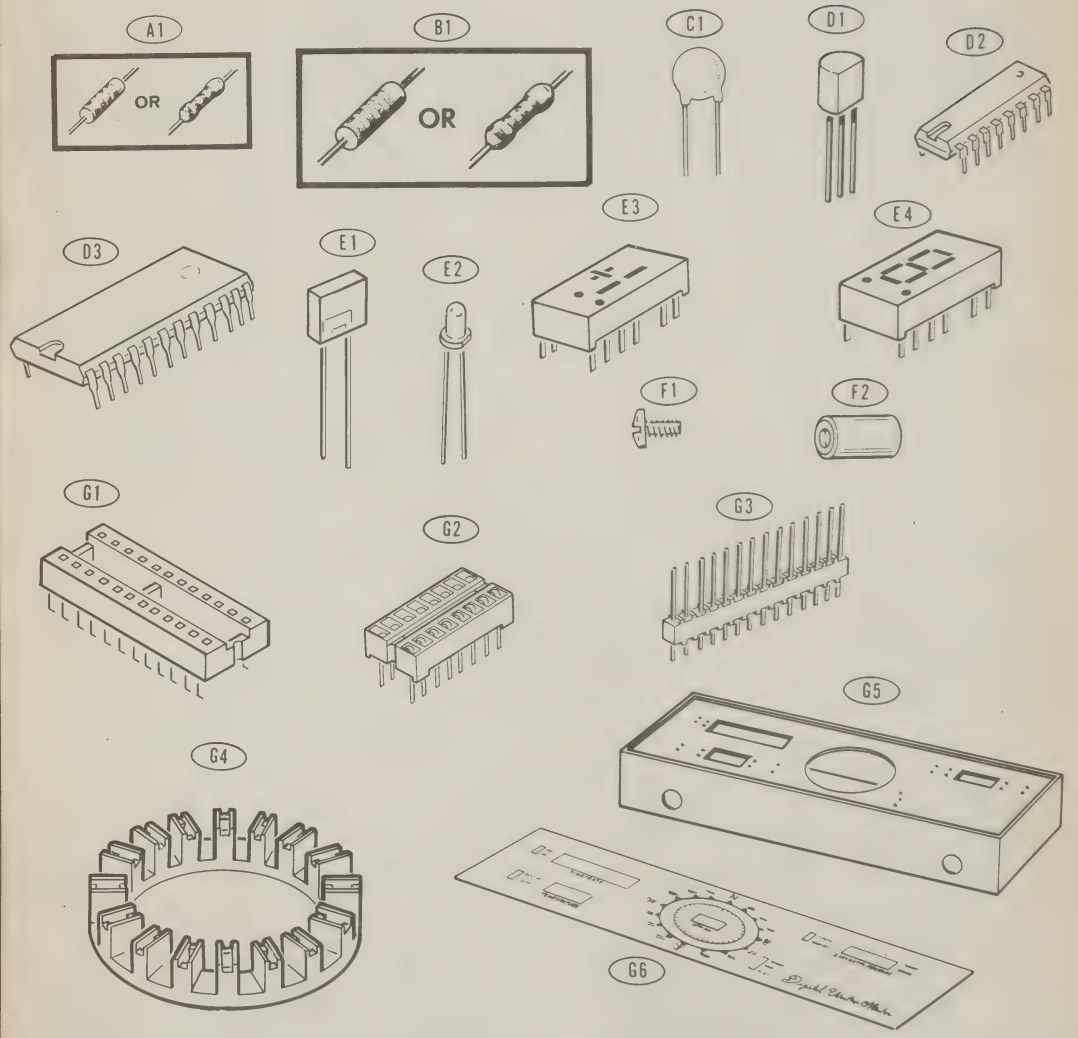
ILLUSTRATION BOOKLET

Part of 595-1999-06

PARTS PICTORIAL #1



PARTS PICTORIAL #2



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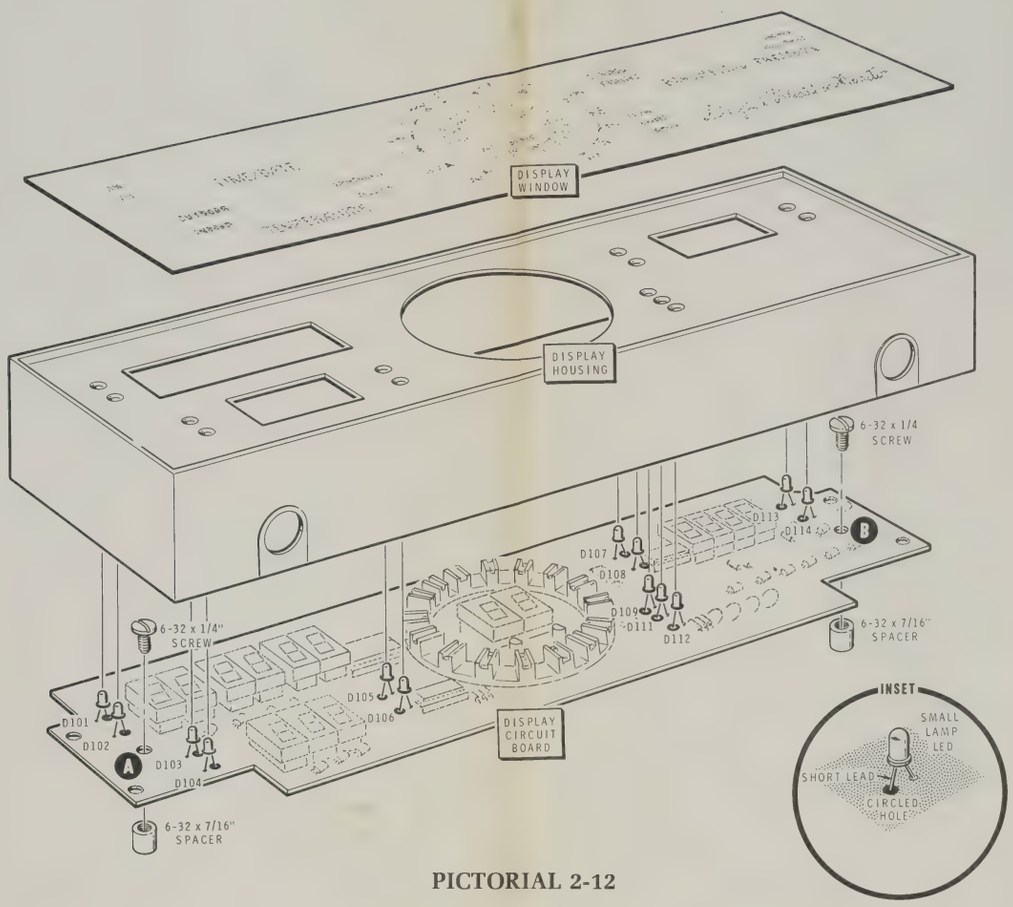
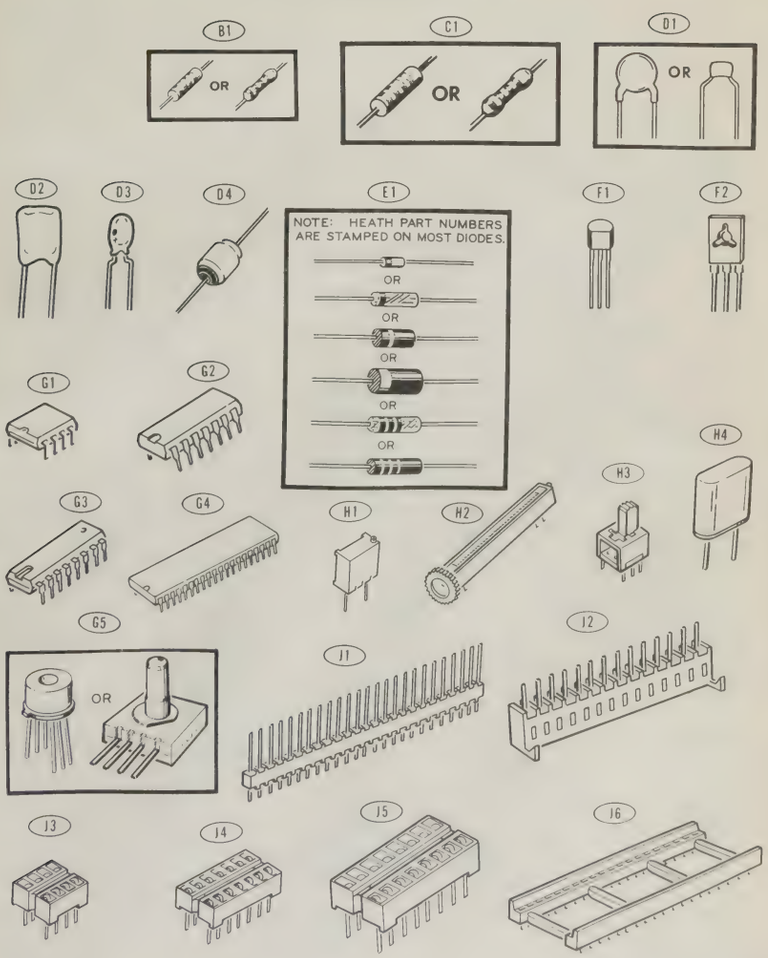
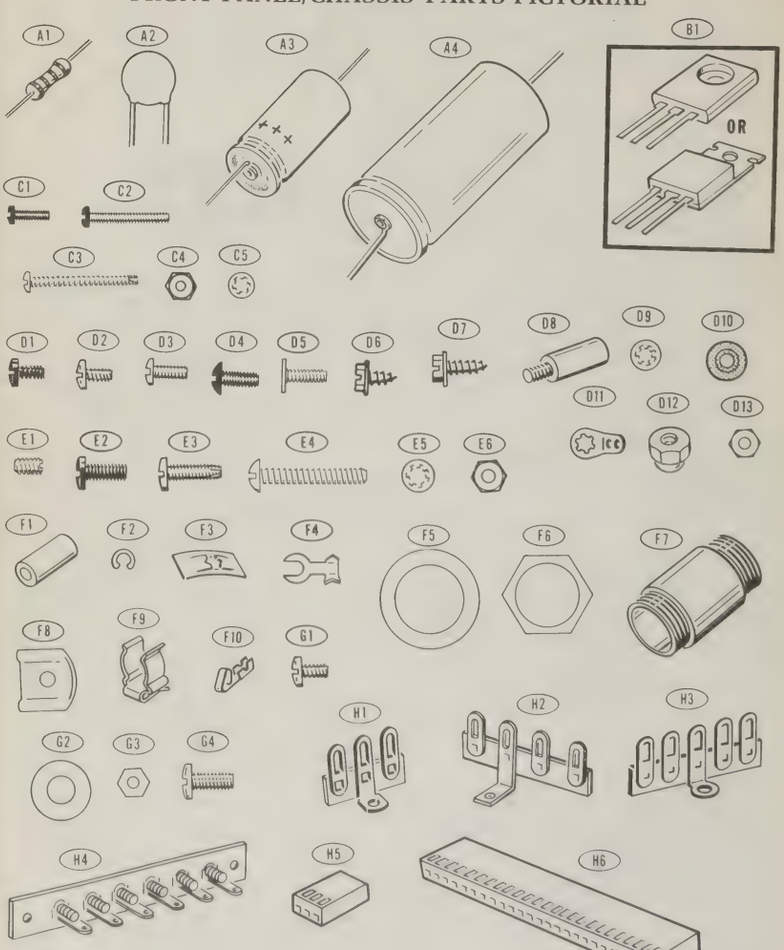


PICTORIAL 2-12

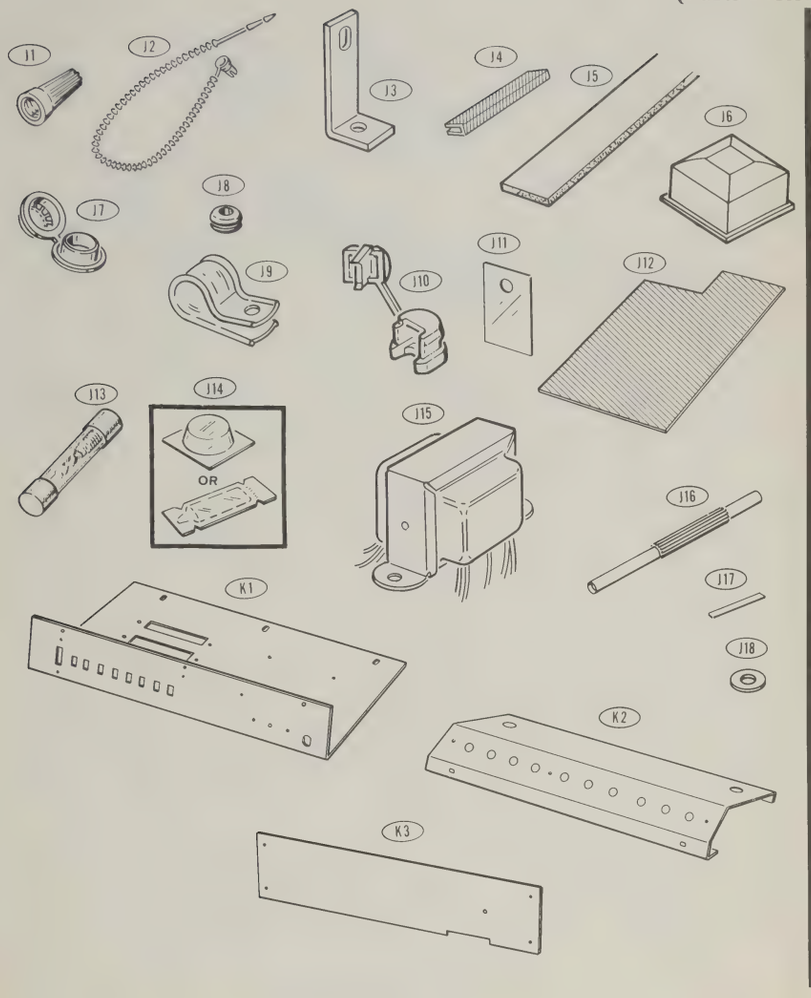
PARTS PICTORIAL #3

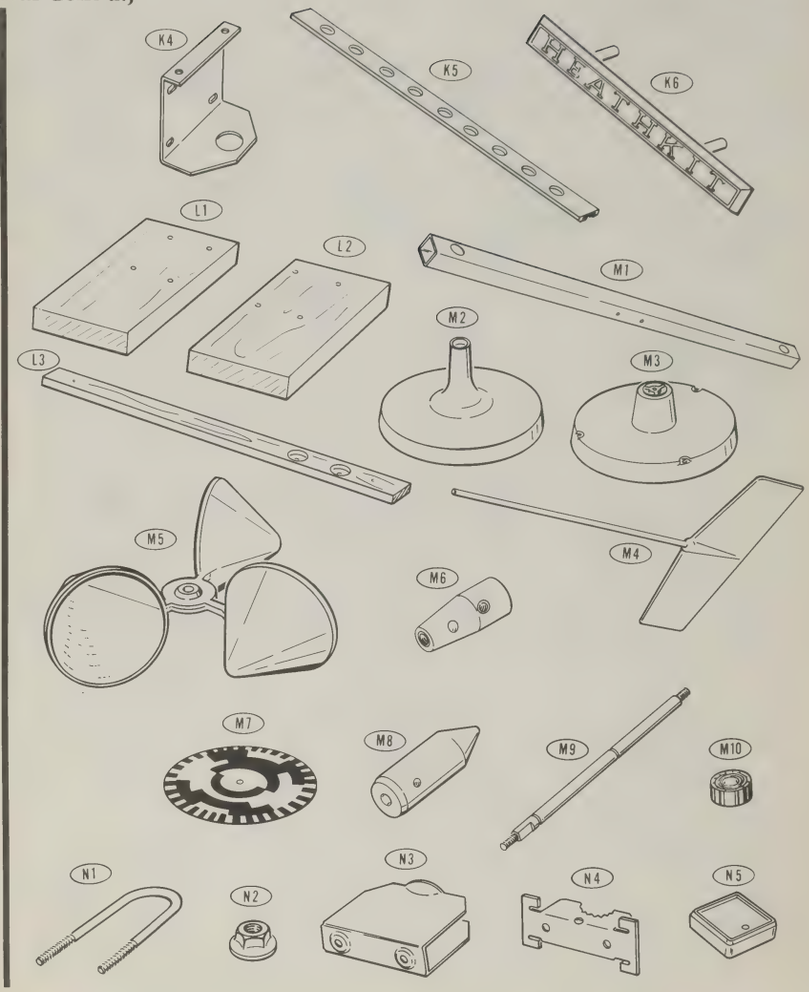


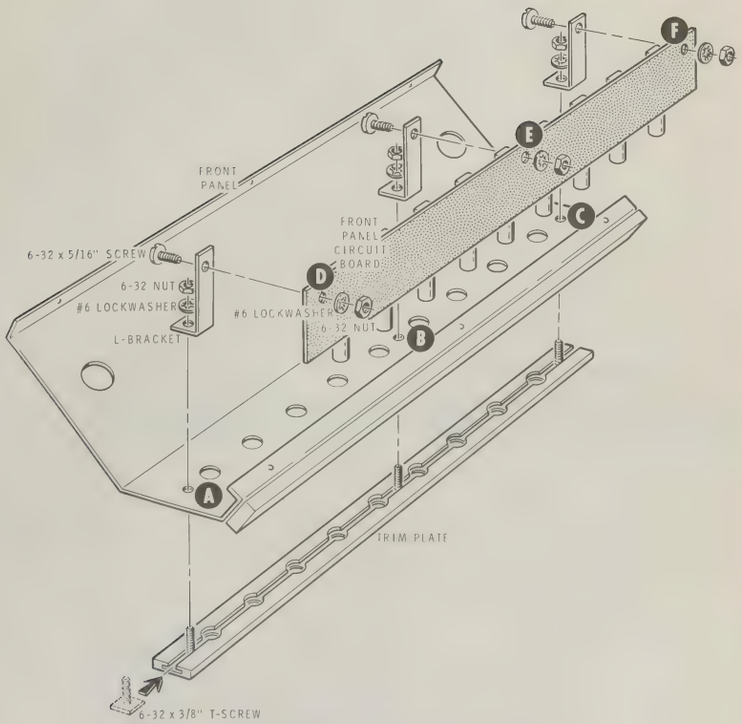
FRONT PANEL/CHASSIS PARTS PICTORIAL



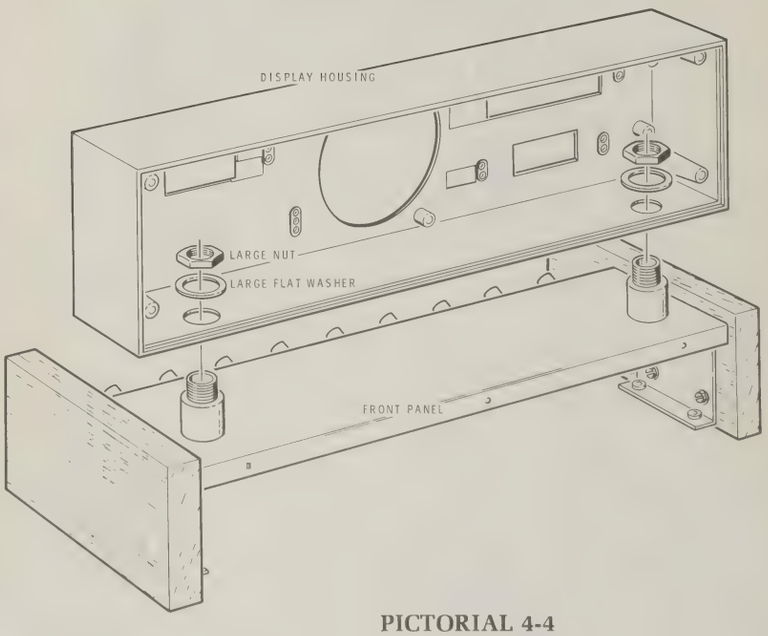
(Parts Pictorial Cont'd.)



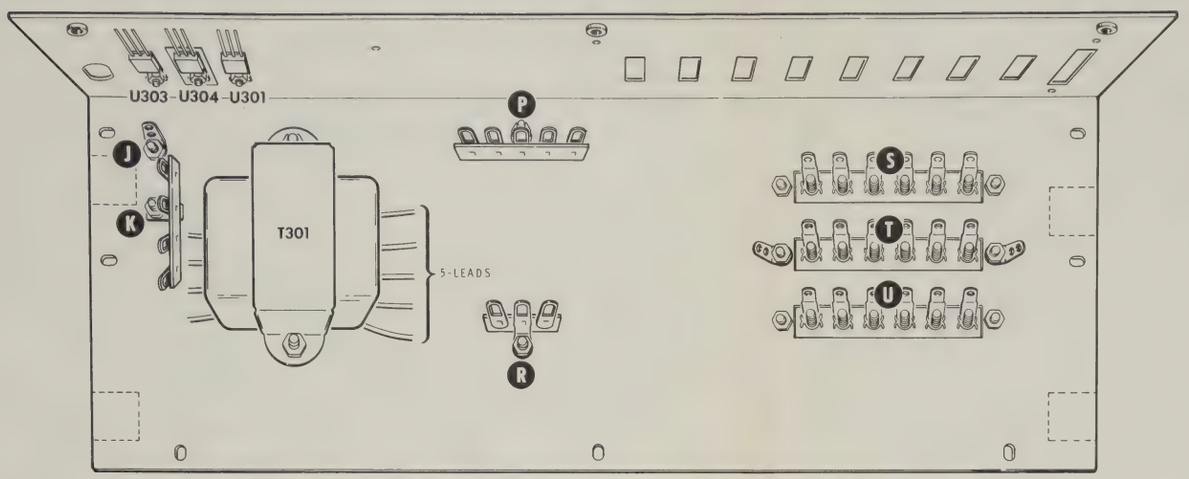




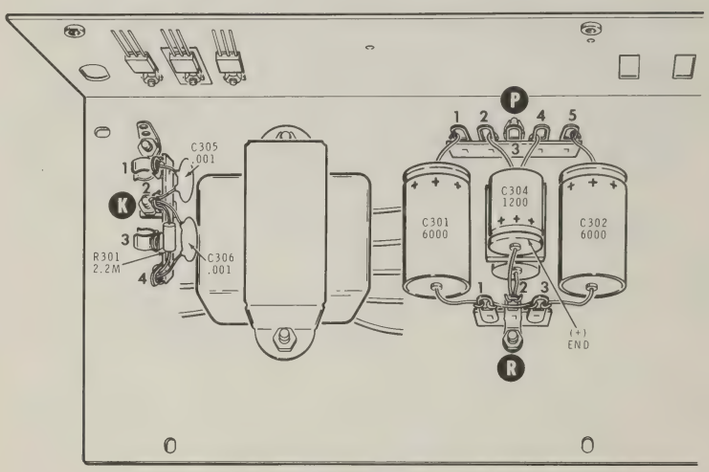
PICTORIAL 4-2



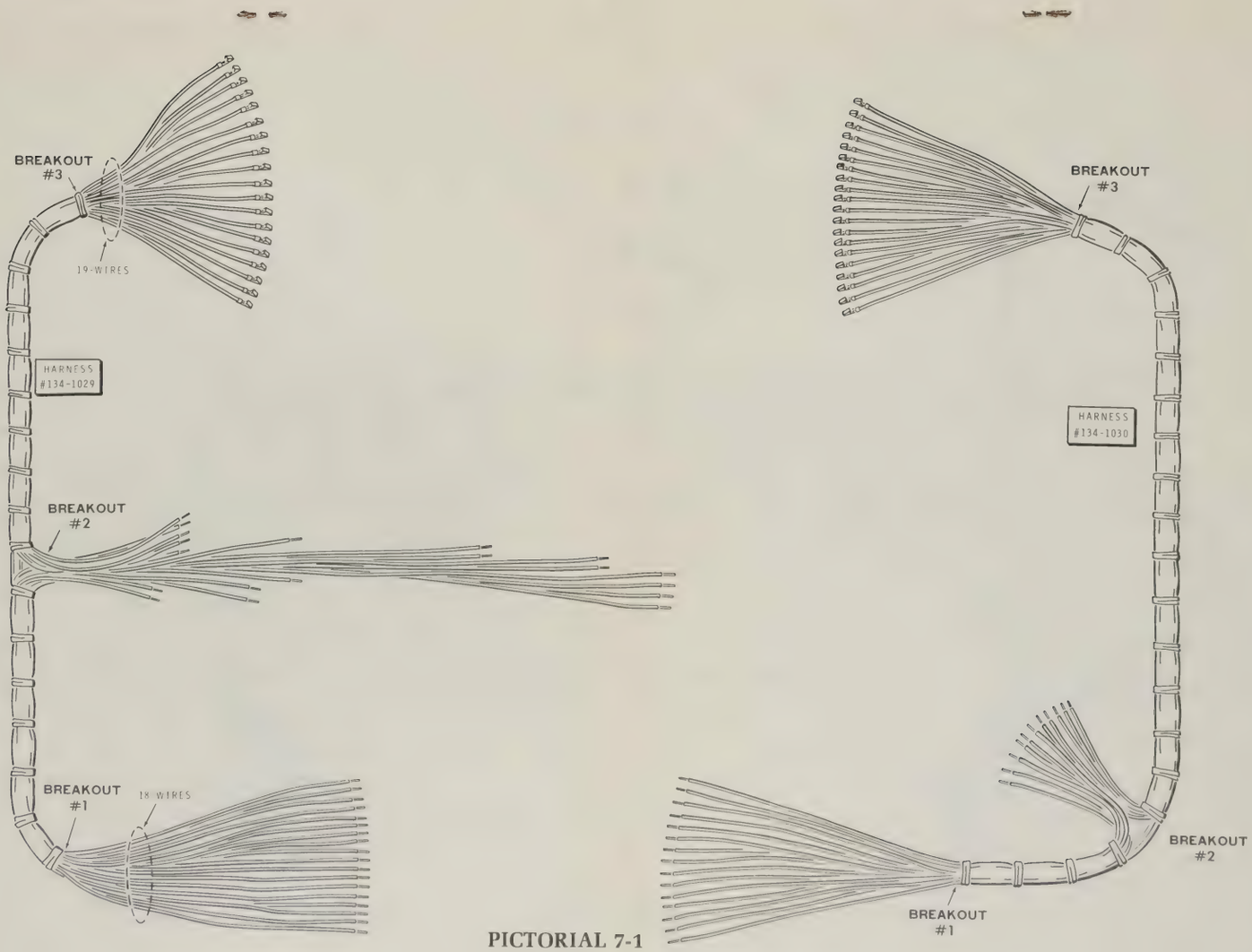
PICTORIAL 4-4



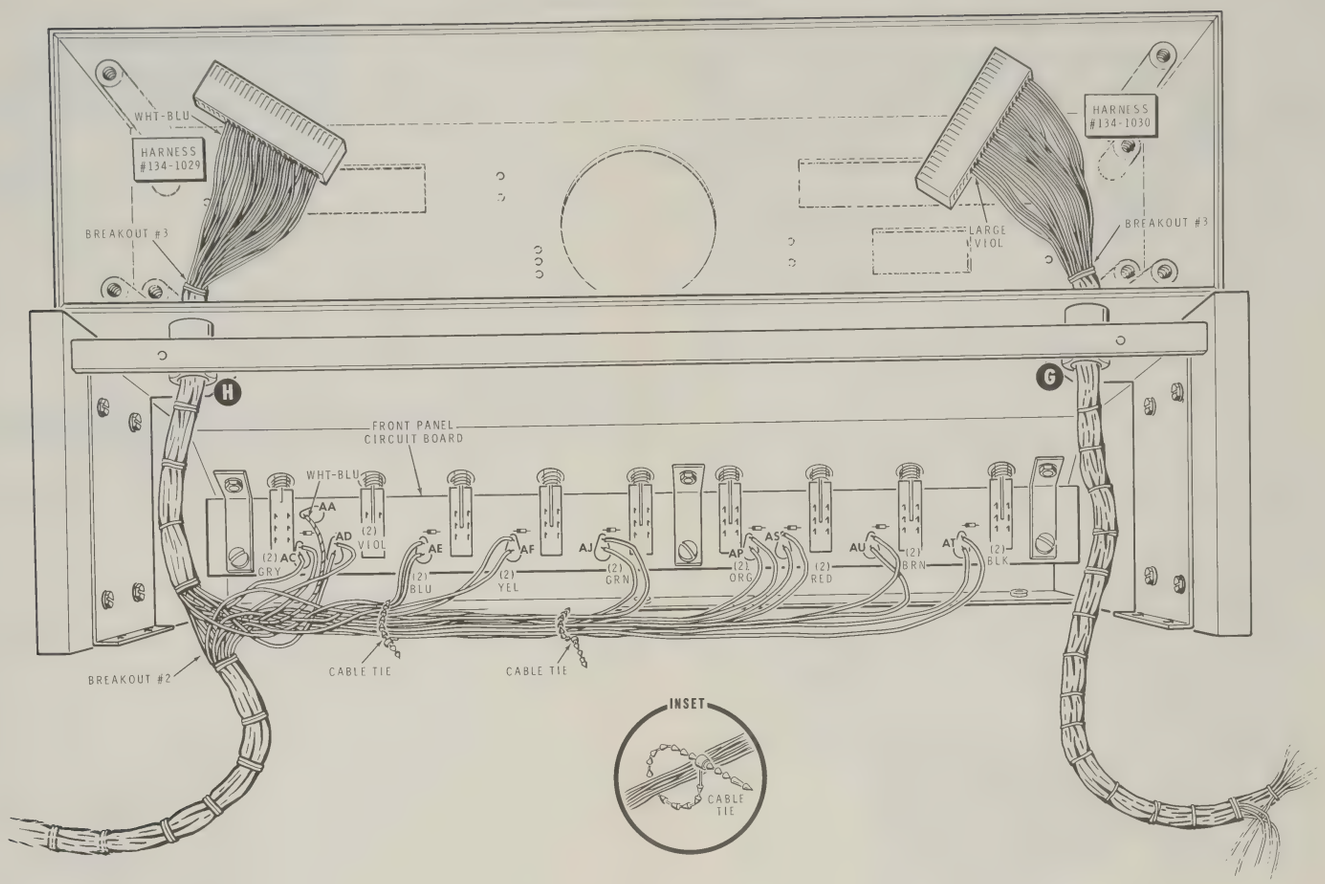
PICTORIAL 5-1



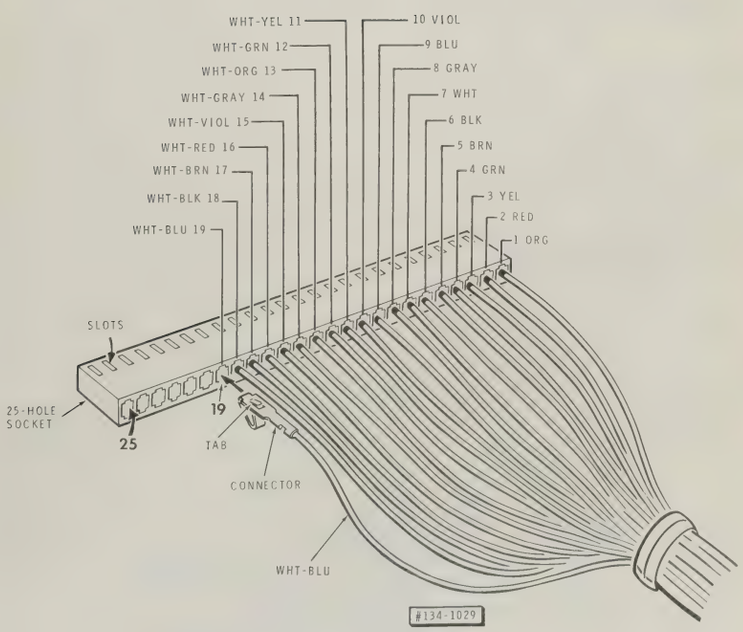
PICTORIAL 6-1



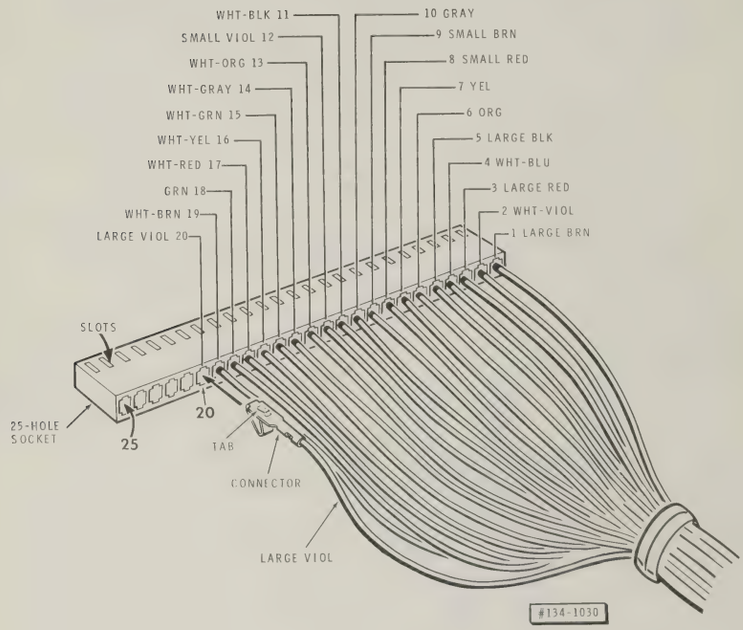
PICTORIAL 7-1



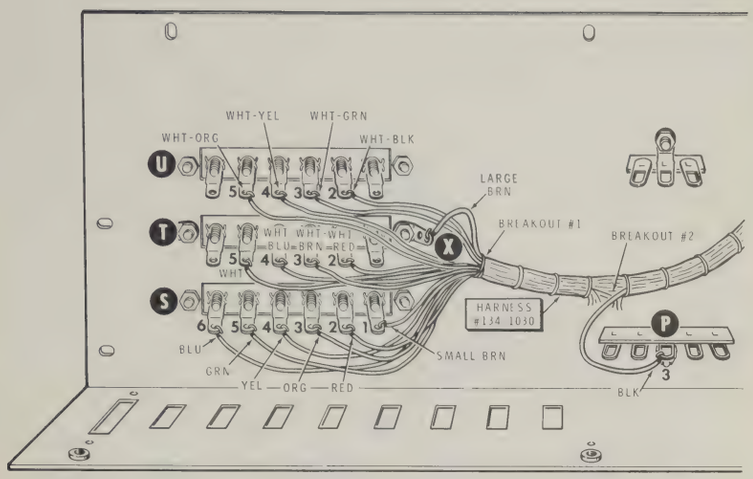
PICTORIAL 7-2



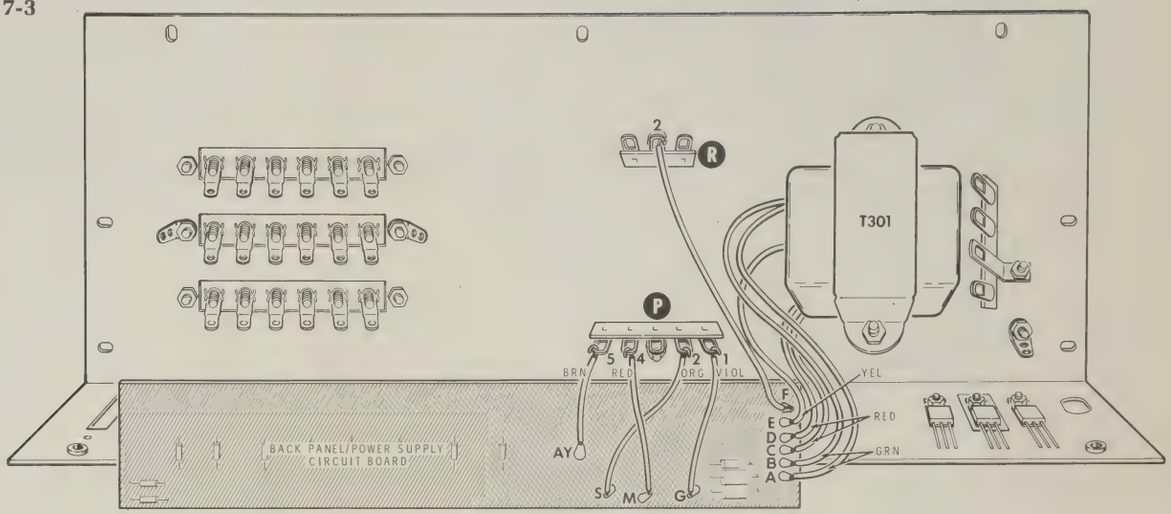
Detail 7-2A



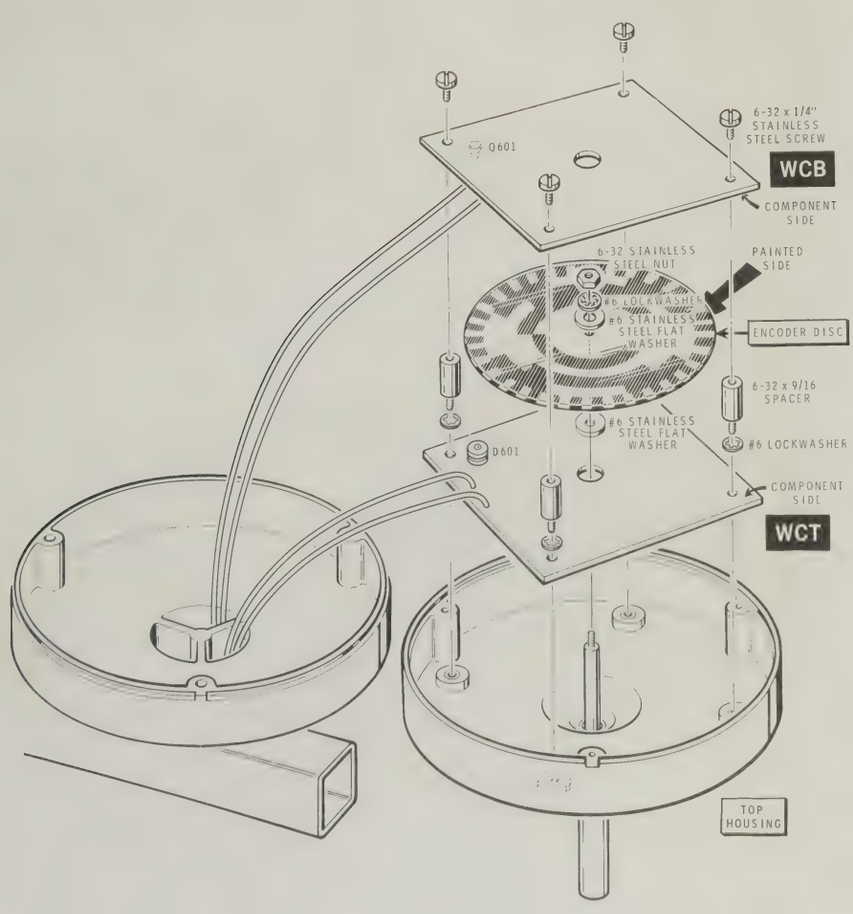
Detail 7-2B



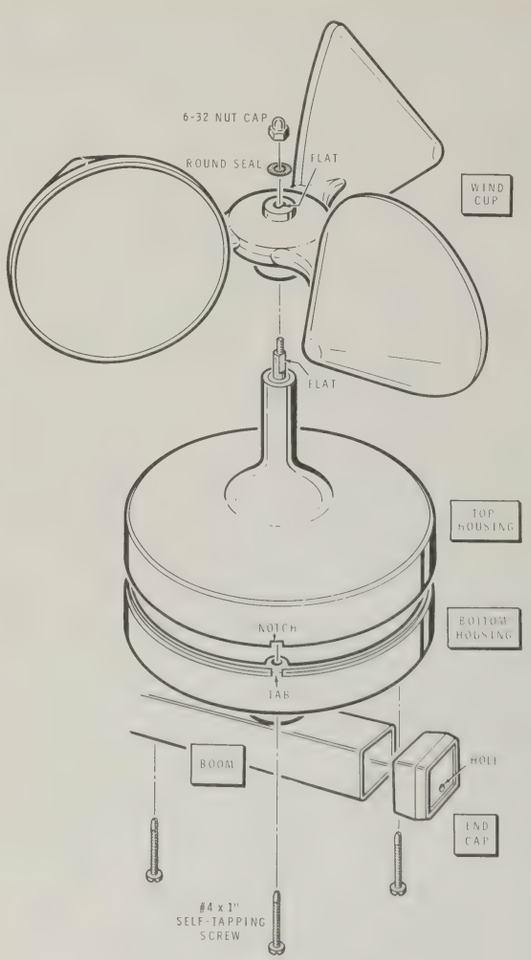
PICTORIAL 7-3



PICTORIAL 7-4



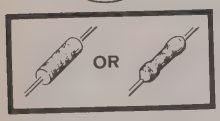
PICTORIAL 9-6



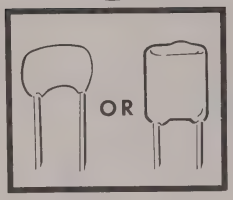
PICTORIAL 9-7

PARTS PICTORIAL #1

A1

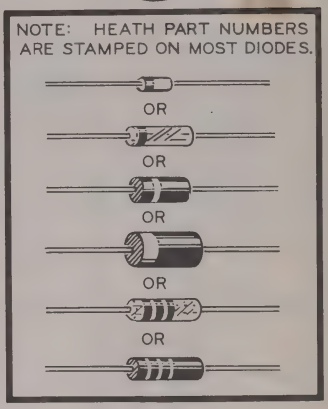


B1



B2

C1



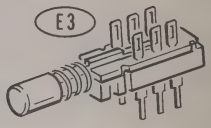
C2

D1

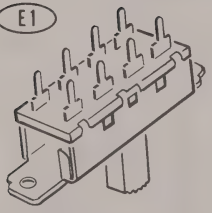
D2

D3

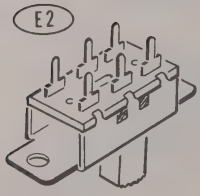
E3



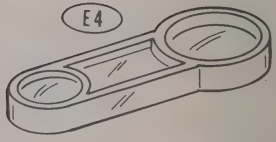
E1



E2

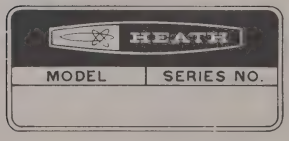


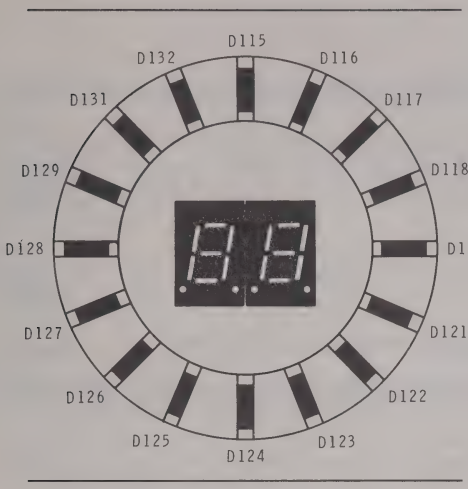
E4



F1

F2





PICTORIAL 2-11

Refer to Pictorial 2-11 for the following steps.

Place the circuit board with the component side up and with the lettering readable. You will be working with the center of the circuit board.

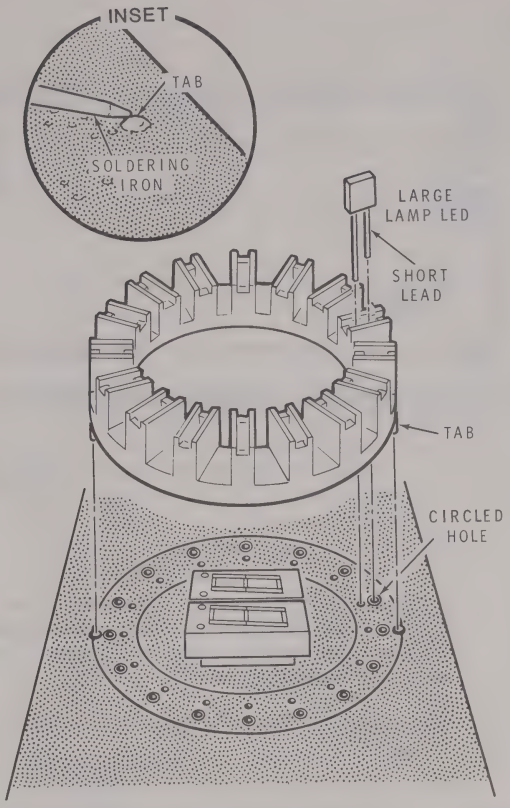
Refer to Detail 2-11A for the following steps.

( ) Place the alignment ring on the circled outline on the circuit board. The two small tabs should seat in their respective holes in the board.

( ) Keep the ring tight against the board and turn the board over. Now melt the two tabs with your soldering iron just enough to flatten them. Then turn the board over again and position it as shown in the Pictorial.

To install the large lamp LED's in the following step, first insert them in the rectangular opening in the alignment ring. Make sure the shorter lead of the LED goes in the circled hole (outside) in the circuit board and the long lead in the unmarked hole. Insert all of the LED's. Then place a flat object over the ring, so the LED's cannot fall out, and turn the circuit board over. Solder the leads to the foil and cut off the excess lead lengths.

( ) Install the 16 large LED's at locations D115 through D132.



Detail 2-11A

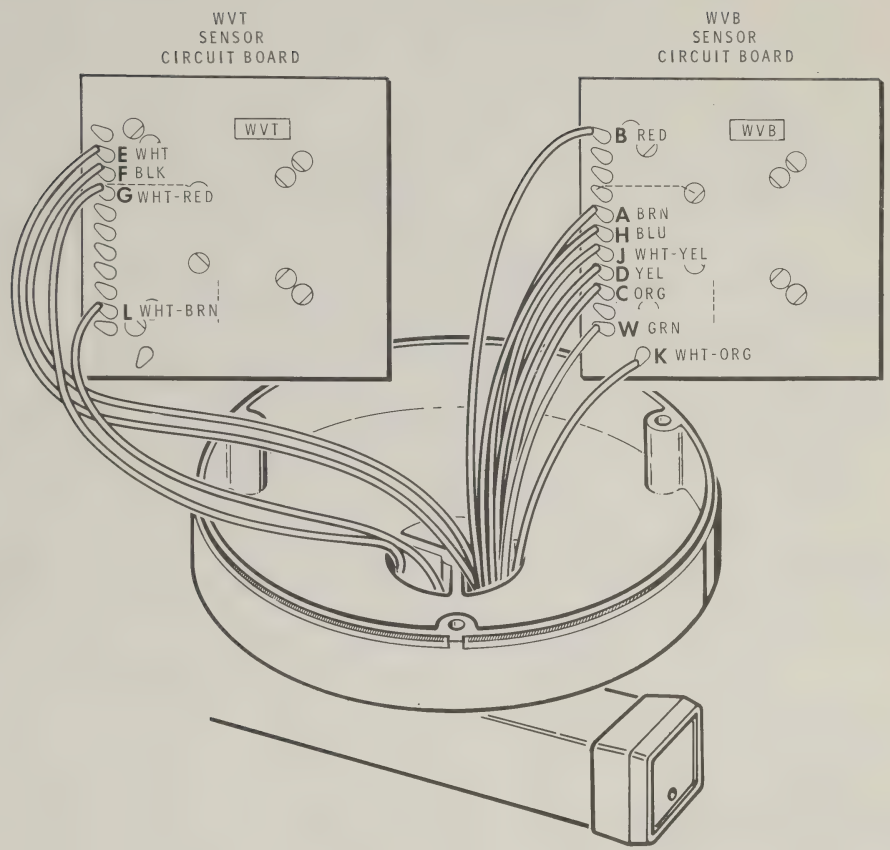
Refer to Pictorial 2-12 (Illustration Booklet, Page 2) for the following steps.

( ) Position the display circuit board as shown and mount 6-32 × 7/16" spacers at A and B with 6-32 × 1/4" screws.

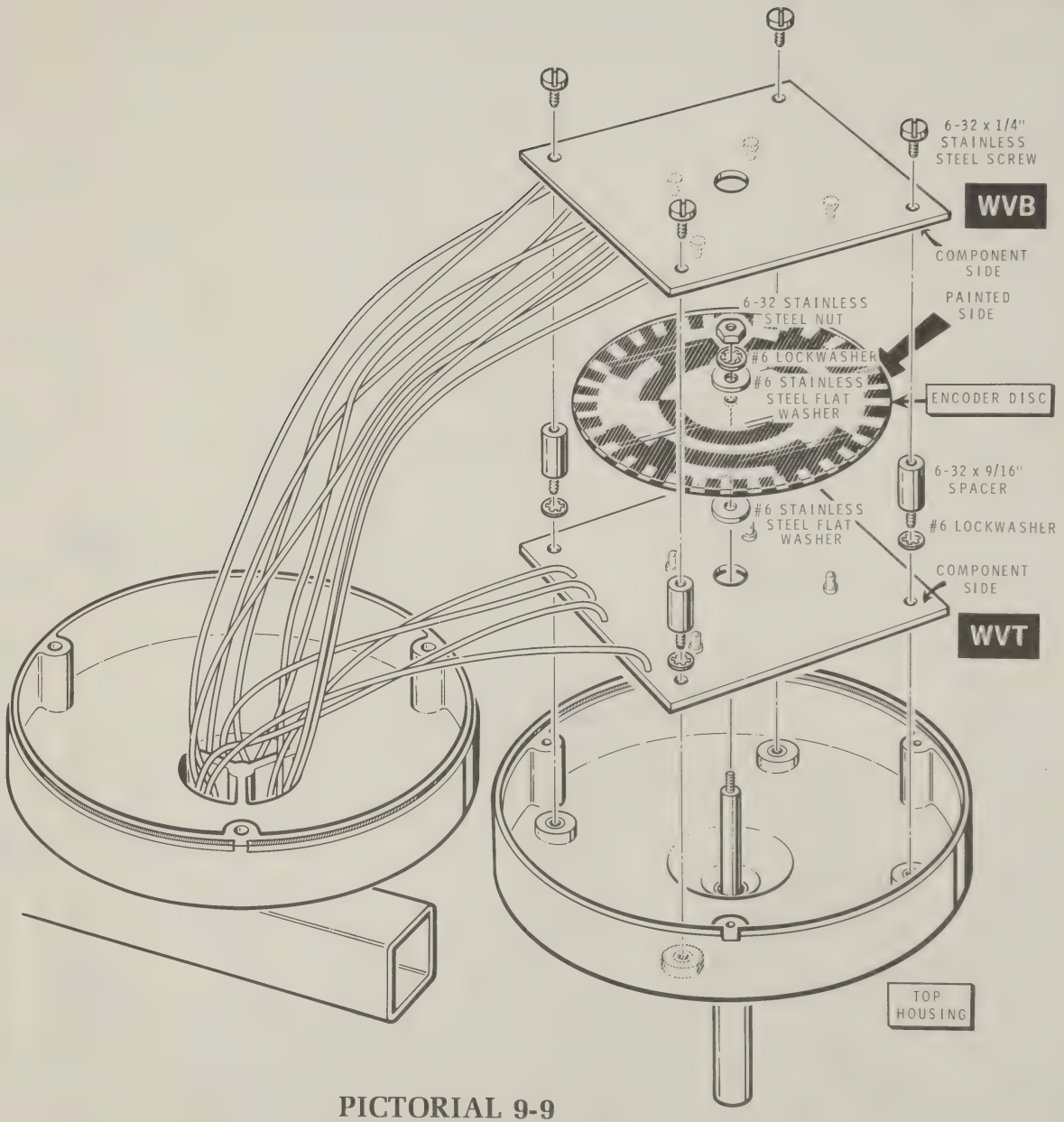
Place a cloth on your work surface that is large enough for the display housing in the following steps.

( ) Peel the protective coating from both sides of the display window. Then position the window and the housing as shown. Center the window carefully in the housing and press it in place.

( ) Set the display housing aside temporarily.



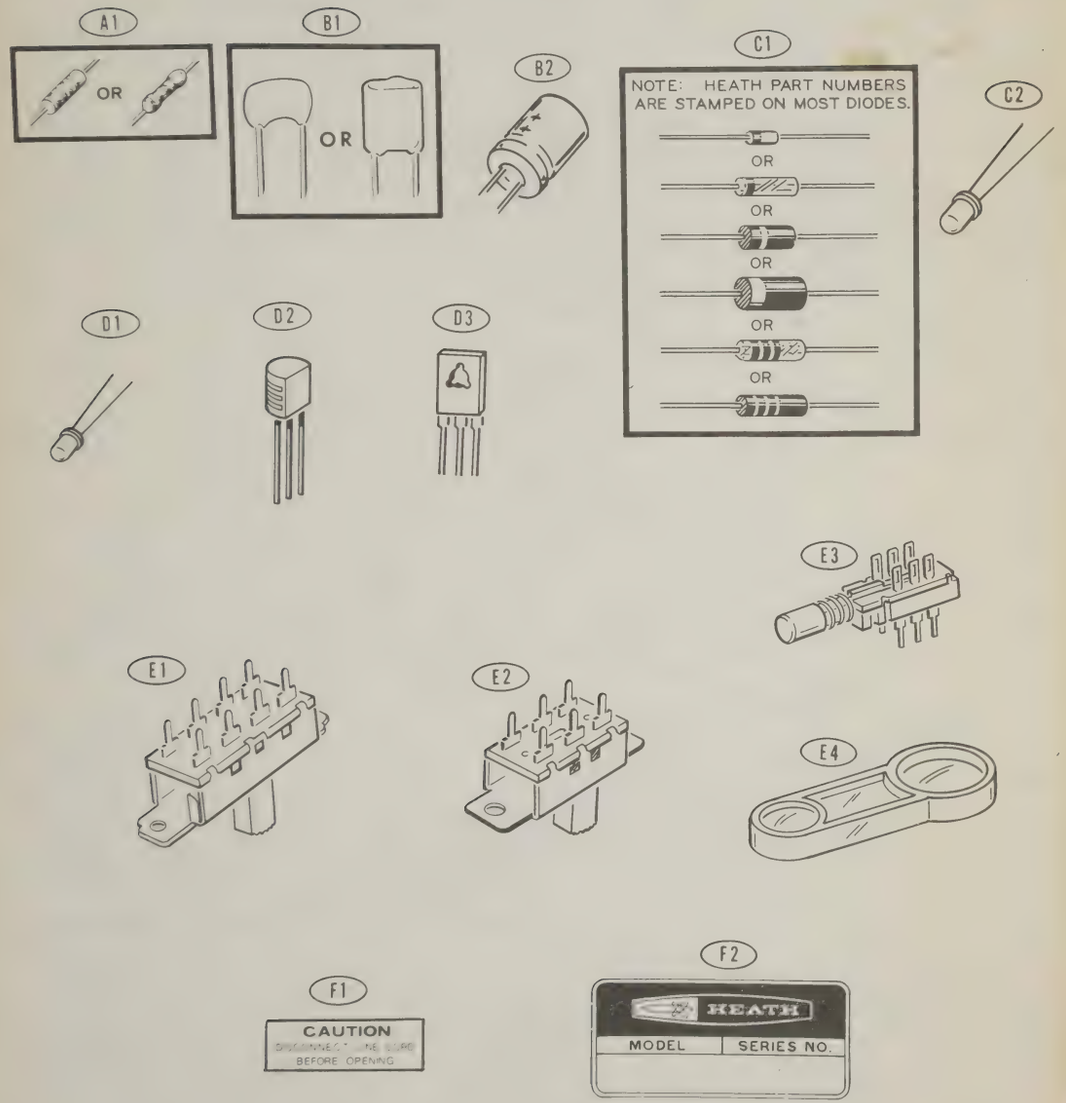
PICTORIAL 9-8

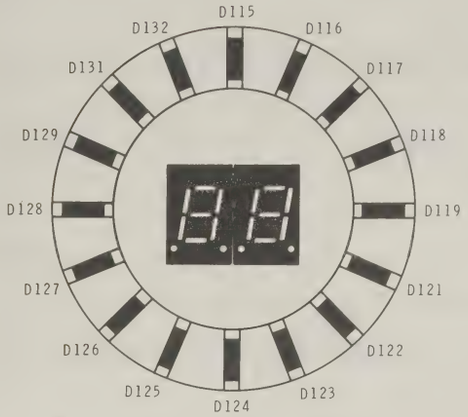


PICTORIAL 9-9

ILLUSTRATI

PARTS PICTORIAL #1





PICTORIAL 2-11

Refer to Pictorial 2-11 for the following steps.

Place the circuit board with the component side up and with the lettering readable. You will be working with the center of the circuit board.

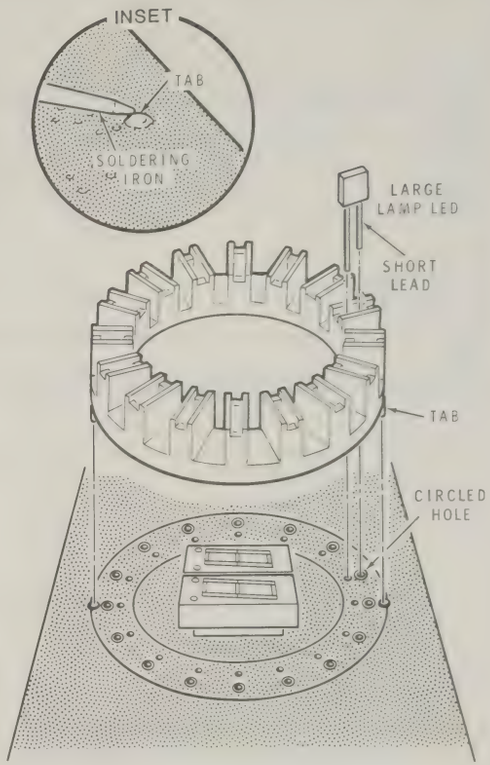
Refer to Detail 2-11A for the following steps.

( ) Place the alignment ring on the circled outline on the circuit board. The two small tabs should seat in their respective holes in the board.

( ) Keep the ring tight against the board and turn the board over. Now melt the two tabs with your soldering iron just enough to flatten them. Then turn the board over again and position it as shown in the Pictorial.

To install the large lamp LED's in the following step, first insert them in the rectangular opening in the alignment ring. Make sure the shorter lead of the LED goes in the circled hole (outside) in the circuit board and the long lead in the unmarked hole. Insert all of the LED's. Then place a flat object over the ring, so the LED's cannot fall out, and turn the circuit board over. Solder the leads to the foil and cut off the excess lead lengths.

( ) Install the 16 large LED's at locations D115 through D132.



Detail 2-11A

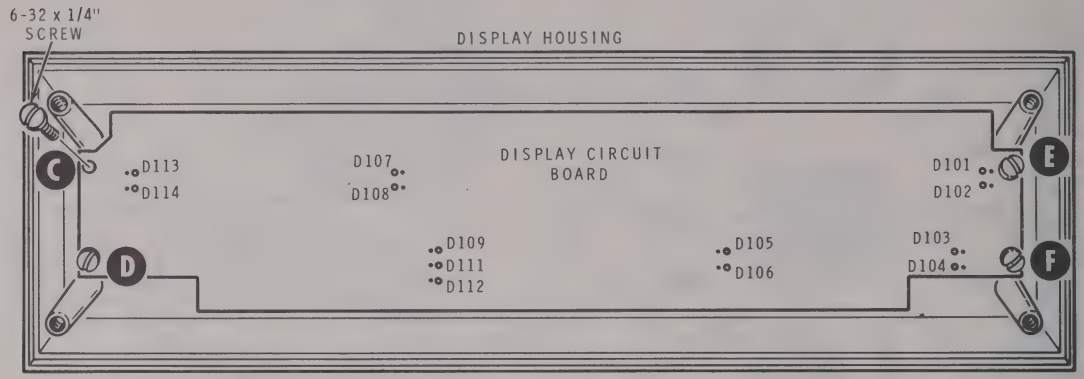
Refer to Pictorial 2-12 (Illustration Booklet, Page 2) for the following steps.

( ) Position the display circuit board as shown and mount 6-32 × 7/16″ spacers at A and B with 6-32 × 1/4″ screws.

Place a cloth on your work surface that is large enough for the display housing in the following steps.

( ) Peel the protective coating from both sides of the display window. Then position the window and the housing as shown. Center the window carefully in the housing and press it in place.

( ) Set the display housing aside temporarily.



PICTORIAL 2-13

( ) Position the display circuit board as shown. Hold it in the middle with either hand. Then install the thirteen small LED's as follows. Do not solder them at this time.

1. Inspect the LED's carefully for the short lead.
2. Insert the short lead into the circled hole in the circuit board and the other lead in the unmarked hole.

( ) Install the LED's at D101, D102, D103, D104, D105, D106, D107, D108, D109, D111, D112, D113, D114. DO NOT solder these diodes at this time.

( ) Place the display housing over the circuit board. Hold the assemblies together and turn them over so the front of the housing is on the cloth.

Refer to Pictorial 2-13 for the following steps.

( ) Fasten the circuit board at C, D, E, and F with 6-32 × 1/4" screws.

( ) The LED's should have fallen into their respective holes in the housing and against the display window. Check each LED by moving it up slightly and then down. The leads should all protrude about the same amount from the circuit board.

( ) Solder the leads of each LED to the foil and cut off the excess lead lengths.

( ) Remove the four screws at C, D, E, and F, and set them and the circuit board aside.

CIRCUIT BOARD CHECKOUT

Carefully inspect the circuit board (the parts installed in Pictorials 2-12, 2-13) for the following conditions.

( ) Unsoldered connections.

( ) Poor solder connections.

( ) Solder bridges between foil patterns.

( ) Protruding leads which could touch together.

CPU CIRCUIT BOARD

PARTS LIST

Refer to the "Pack Index Sheet," and locate Pack #3. Remove Pack #3 and check each part against the following list and Parts Pictorial #3 (Illustration Booklet, Page 3). Any part that is packed in an individual envelope with the part number on it should be placed back in the envelope after you identify it until it is called for in a step. Do not discard any packing materials until all parts are accounted for.

To order a replacement part, always include the Part Number and use the Parts Order Form furnished with this kit. If a Parts Order Form is not available, use one of the "Expedited Parts Order Forms" at the rear of this Manual, or refer to "Replacement Parts" inside the rear cover. Your Warranty is inside the front cover. For pricing information, refer to the separate "Heath Parts Price List."

RESISTORS

NOTE: The resistors may be packed in more than one envelope. Open all the resistor envelopes in this pack before you check them against the Parts List.

1/4-Watt, 1% (last band brown)

NOTE: Some of the following resistors may have either a color code or a number code to identify their values. Both are listed in the parts list where necessary.

KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.
B1	2-752-12	1	332 Ω (3320F) (orange-orange-red-black)	R256
B1	2-757-12	1	1000 Ω (1001F) (brown-black-black-brown)	R238
B1	6-2431-12	2	2430 Ω (red-yellow-orange-brown)	R203, R218
B1	2-753-12	1	3010 Ω (3011F) (orange-black-brown-brown)	R255
B1	2-754-12	4	10 kΩ (1002F) (brown-black-black-red)	R243, R244, R245, R247
B1	6-1602-12	2	16 kΩ (brown-blue-black-red)	R211, R225
B1	6-2102-12	2	21 kΩ (red-brown-black-red)	R204, R221

Resistors (cont'd.)

KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.
B1	6-2502-12	2	25 kΩ (red-green-black-red)	R207, R222
B1	6-4202-12	4	42 kΩ (yellow-red-black-red)	R206, R208, R219, R223
B1	2-755-12	2	64.2 kΩ (6422F) (blue-yellow-red-red)	R237, R242
B1	2-756-12	1	412 kΩ (4123F) (yellow-brown-red-orange)	R227

1/4-Watt, 5% (last band gold)

B1	6-181-12	1	180 Ω (brown-gray-brown)	R264
B1	6-102-12	1	1000 Ω (brown-black-red)	R257
B1	6-392-12	2	3900 Ω (orange-white-red)	R271, R272
B1	6-472-12	3	4700 Ω (yellow-violet-red)	R234, R236, R259
B1	6-562-12	2	5600 Ω (green-blue-red)	R213, R214
B1	6-622-12	2	6200 Ω (blue-red-red)	R202, R217
B1	6-912-12	2	9100 Ω (white-brown-red)	R201, R216
B1	6-103-12	7	10 kΩ (brown-black-orange)	R258, R262, R269, R273, R275, R276, R277

KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.
Resistors (cont'd.)				
B1	6-123-12	1	12 kΩ (brown-red-orange)	R215
B1	6-393-12	2	39 kΩ (orange-white-orange)	R235, R274
B1	6-473-12	2	47 kΩ (yellow-violet-orange)	R229, R233
B1	6-104-12	6	100 kΩ (brown-black-yellow)	R212, R226, R228, R246, R261, R263
1/2-Watt, 5% (last band gold)				
C1	6-471	1	470 Ω (yellow-violet-brown)	R231
CAPACITORS				
D1	21-86	1	75 pF ceramic	C212
D1	21-711	10	470 pF ceramic	C201, C203, C204, C205, C207, C208, C209, C210, C220, C230
D1	21-199	1	.1 μF ceramic	C214
D2	27-185	1	.03 μF Mylar	C213
D3	25-917	2	10 μF electrolytic	C215, C216
D4	29-22	1	4700 pF polystyrene	C211
DIODES				
E1	56-56	5	1N4149	D202, D203, D204, D207, D208
E1	56-602	1	Germanium selected	D205
E1	56-85	1	Zener	D201
D1	56-616	1	Zener	D206

TRANSISTORS — INTEGRATED CIRCUITS (IC's) — TRANSDUCER

NOTE: Transistors and integrated circuits are marked for identification in one of the following ways:

1. Part number.
2. Type number. (For integrated circuits, this refers to the numbers, the letters may be different or missing.)
3. Part number and type number.
4. Part number with a type number other than the one listed.

KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.
Transistors — Integrated Circuits (IC's) — Transducer (Cont'd.)				
F1	417-235	7	2N4121 transistor	Q201, Q202, Q203, Q209, Q211, Q212, Q214
F1	417-801	7	MPSA20 transistor	Q204, Q205, Q206, Q207, Q213, Q215, Q216
F2	417-818	1	MED181 transistor	Q208
G1	442-21	2	MC1458 IC	U203, U204
G2	442-602	2	LM324N IC	U201, U202

CAUTION: The following IC's can be damaged by static electricity. Do not remove these IC's from the conductive foam until you are instructed to do so.

G2	442-99	1	CD4016 IC	U207
G3	443-721	1	MM2112-2 IC	U206
G4	444-23	1	MC3870 IC	U205
G5	442-699	1	Pressure transducer with resistors	A201
CONTROLS — SWITCH — CRYSTAL				
H1	10-1153	1	1000 Ω (w1k) miniature control	R241
H1	10-1154	1	10 kΩ (w10k) miniature control	R239
H2	10-1073	2	10 kΩ control	R209, R224
H2	10-959	2	100 kΩ control	R205, R267
H3	60-604	1	Slide switch	SW201
H4	404-238	1	3579.545 kHz crystal	X201
SOCKETS — PLUGS				
J1	432-1075	2	25-pin plug	P201, P206
J2	432-1008	3	14-pin socket	
J3	434-230	2	8-pin IC socket	
J4	434-298	3	14-pin IC socket	
J5	434-299	1	16-pin IC socket	
J6	434-253	1	40-pin IC socket	
ITEM FROM FINAL PACK				
	85-2480-1	1	CPU circuit board	

STEP-BY-STEP ASSEMBLY

START

Position the CPU circuit board as shown. In the following Pictorials you will be working with either the left half or the right half of the circuit board. In this Pictorial you will be working with the left half. NOTE: The following are 5% resistors (front band gold) unless they are marked otherwise.

( ) R238: 1000 Ω, (1001F) 1% (brown-black-black-brown).

( ) R275: 10 kΩ, 5% (brown-black-orange-gold).

( ) R242: 64.2 kΩ (6422F), 1% (blue-yellow-red-red).

( ) R243: 10 kΩ (1002F), 1% (brown-black-black-red).

( ) R247: 10 kΩ (1002F), 1% (brown-black-black-red).

( ) Solder the leads to the foil and cut off the excess lead lengths.

( ) R256: 332 Ω (3320F), 1% (orange-orange-red-black).

( ) R255: 3010 Ω (3011F), 1% (orange-black-brown-brown).

( ) R227: 412 kΩ (4123F), 1% (yellow-brown-red-orange).

( ) R261: 100 kΩ (brown-black-yellow).

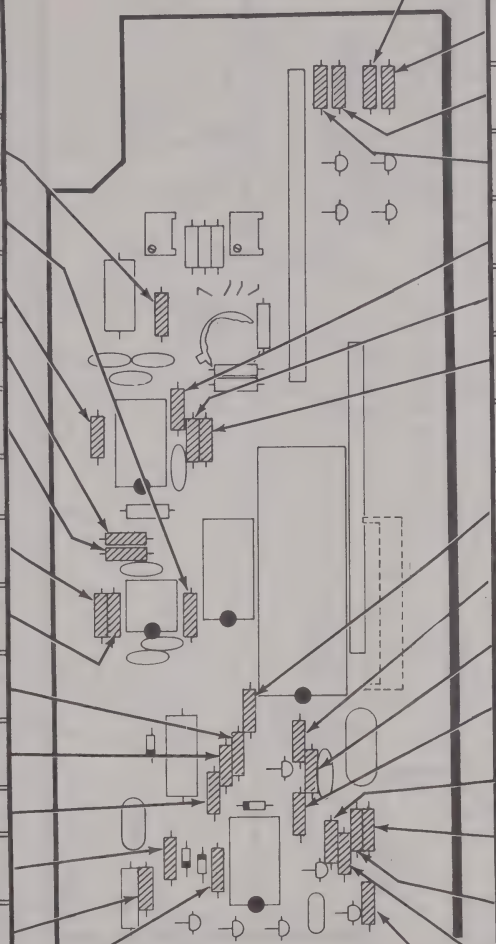
( ) R214: 5600 Ω (green-blue-red).

( ) R212: 100 kΩ (brown-black-yellow).

( ) R229: 47 kΩ (yellow-violet-orange).

( ) R215: 12 kΩ (brown-red-orange).

( ) Solder the leads to the foil and cut off the excess lead lengths.



PICTORIAL 3-1

CONTINUE

( ) R269: 10 kΩ, 5% (brown-black-orange-gold).

( ) R271: 3900 Ω (orange-white-red).

( ) R272: 3900 Ω (orange-white-red).

( ) R273: 10 kΩ, 5% (brown-black-orange-gold).

( ) R237: 64.2 kΩ (6422F), 1% (blue-yellow-red-red).

( ) R245: 10 kΩ (1002F), 1% (brown-black-black-red).

( ) R244: 10 kΩ (1002F), 1% (brown-black-black-red).

( ) Solder the leads to the foil and cut off the excess lead lengths.

( ) R259: 4700 Ω (yellow-violet-red).

( ) R276: 10 kΩ, 5% (brown-black-orange-gold).

( ) R258: 10 kΩ, 5% (brown-black-orange-gold).

( ) R257: 1000 Ω (brown-black-red-gold).

( ) R235: 39 kΩ (orange-white-orange).

( ) R274: 39 kΩ (orange-white-orange).

( ) R234: 4700 Ω (yellow-violet-red).

( ) R236: 4700 Ω (yellow-violet-red).

( ) R233: 47 kΩ (yellow-violet-orange).

( ) Solder the leads to the foil and cut off the excess lead lengths.

START

You will be working with the right half of the circuit board in this Pictorial.

( ) R231: 470 Ω, 1/2-watt (yellow-violet-brown).

( ) R228: 100 kΩ (brown-black-yellow).

( ) R213: 5600 Ω (green-blue-red).

( ) R225: 16 kΩ, 1% (brown-blue-black-red).

( ) R211: 16 kΩ, 1% (brown-blue-black-red).

( ) R222: 25 kΩ, 1% (red-green-black-red).

( ) R223: 42 kΩ, 1% (yellow-red-black-red).

( ) Solder the leads to the foil and cut off the excess lead lengths.

( ) R221: 21 kΩ, 1% (red-brown-black-red).

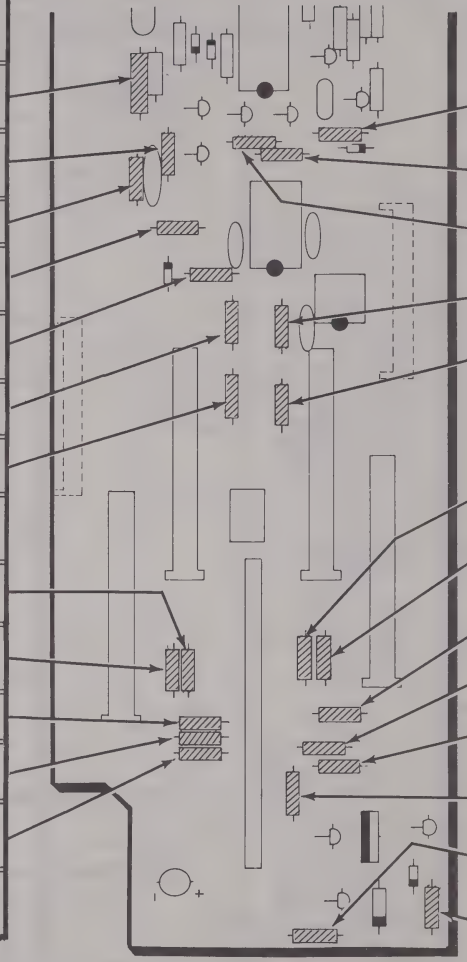
( ) R218: 2430 Ω, 1% (red-yellow-orange-brown).

( ) R217: 6200 Ω (blue-red-red).

( ) R219: 42 kΩ, 1% (yellow-red-black-red).

( ) R216: 9100 Ω (white-brown-red).

( ) Solder the leads to the foil and cut off the excess lead lengths.



CONTINUE

( ) R246: 100 kΩ (brown-black-yellow).

( ) R226: 100 kΩ (brown-black-yellow).

( ) R277: 10 kΩ, 5% (brown-black-orange-gold).

( ) R207: 25 kΩ, 1% (red-green-black-red).

( ) R208: 42 kΩ, 1% (yellow-red-black-red).

( ) Solder the leads to the foil and cut off the excess lead lengths.

( ) R204: 21 kΩ, 1% (red-brown-black-red).

( ) R203: 2430 Ω, 1% (red-yellow-orange-brown).

( ) R206: 42 kΩ, 1% (yellow-red-black-red).

( ) R202: 6200 Ω (blue-red-red).

( ) R201: 9100 Ω (white-brown-red).

( ) R262: 10 kΩ, 5% (brown-black-orange-gold).

( ) R263: 100 kΩ (brown-black-yellow).

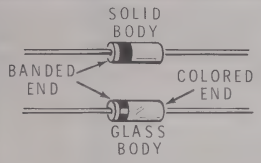
( ) R264: 180 Ω (brown-gray-brown).

( ) Solder the leads to the foil and cut off the excess lead lengths.

PICTORIAL 3-2

START

You will be working with the right half of the circuit board in this Pictorial.



If your diode has a solid body, the band is clearly defined. If your diode has a glass body, do not mistake the colored end **inside** the diode for the banded end. Look for a band painted on the **outside** of the glass.

( ) D201: Zener (#56-85).

( ) D202: 1N4149 (#56-56).

( ) D207: 1N4149 (#56-56).

( ) D203: 1N4149 (#56-56).

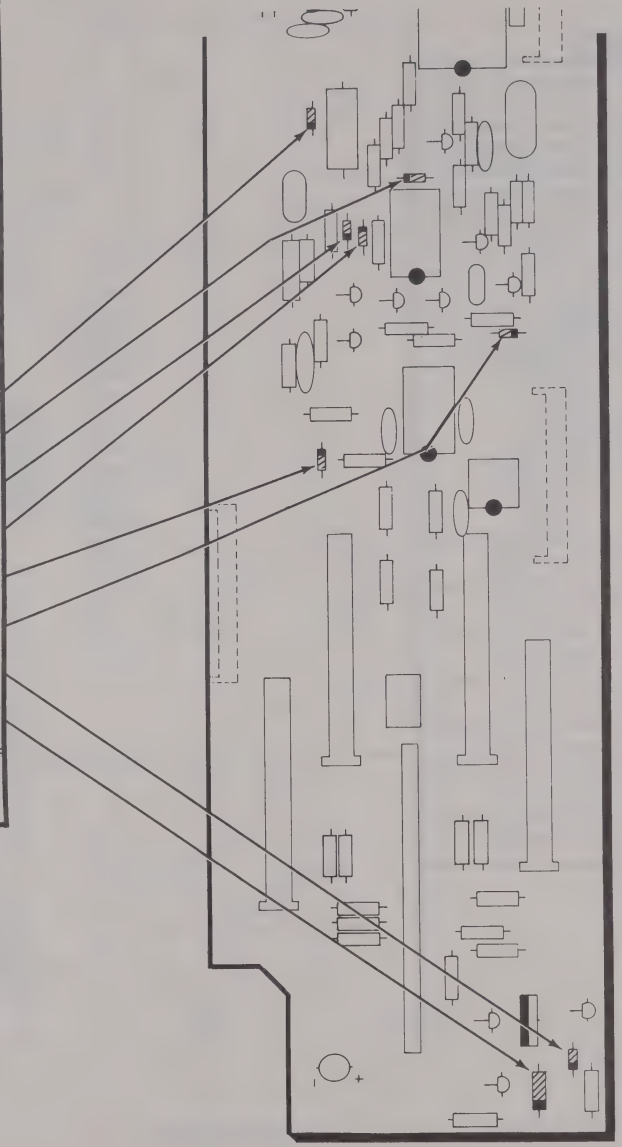
( ) D205: Germanium selected (#56-602).

( ) D204: 1N4149 (#56-56).

( ) D208: 1N4149 (#56-56).

( ) D206: Zener (#56-616).

( ) Solder the leads to the foil and cut off the excess lead lengths.

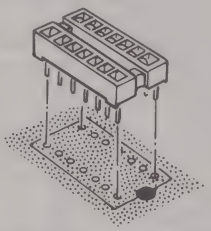


PICTORIAL 3-3

START

You will be working with the left half of the circuit board in this Pictorial.

NOTE: The IC sockets that you will install in the following steps can be installed either way in the circuit board. Be sure the pins are straight, insert the pins into the holes, and solder the pins to the foil as you install each socket.



( ) 14-pin IC socket at U202.

( ) 16-pin IC socket at U206.

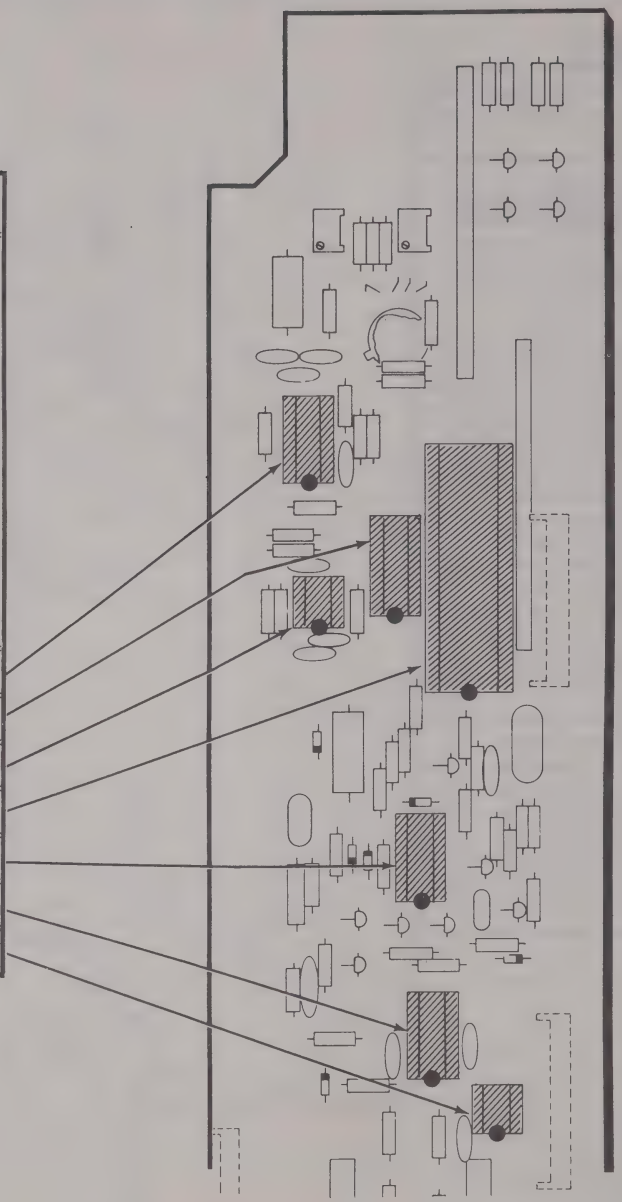
( ) 8-pin IC socket at U203.

( ) 40-pin IC socket at U205.

( ) 14-pin IC socket at U207.

( ) 14-pin IC socket at U201.

( ) 8-pin IC socket at U204.



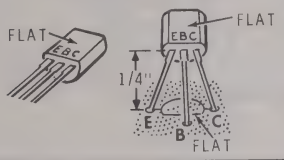
PICTORIAL 3-4

START

You will be working with the left half of the circuit board in this Pictorial.

NOTE: In the following steps, install each of the transistors as follows:

1. Refer to the illustration example below and identify the E, B, and C leads of the transistor.
2. Bend the B lead of each transistor **toward the flat**.
3. Insert the transistor leads into the corresponding E, B, and C holes in the circuit board.
4. Position the transistor approximately 1/4" above the circuit board.
5. Turn the circuit board over, solder the leads to the foil, and cut off the excess lead lengths.



( ) Q206: MPSA20 (#417-801).

( ) Q205: MPSA20 (#417-801).

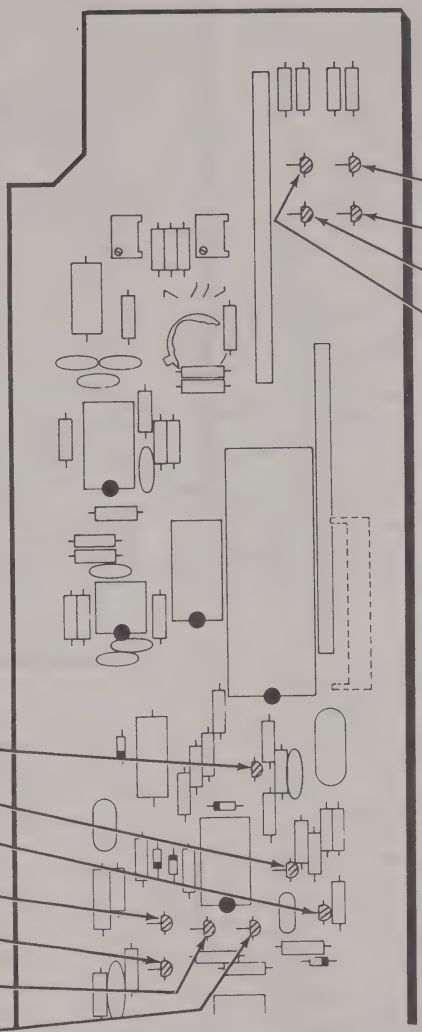
( ) Q204: MPSA20 (#417-801).

( ) Q201: 2N4121 (#417-235).

( ) Q209: 2N4121 (#417-235).

( ) Q202: 2N4121 (#417-235).

( ) Q203: 2N4121 (#417-235).



CONTINUE

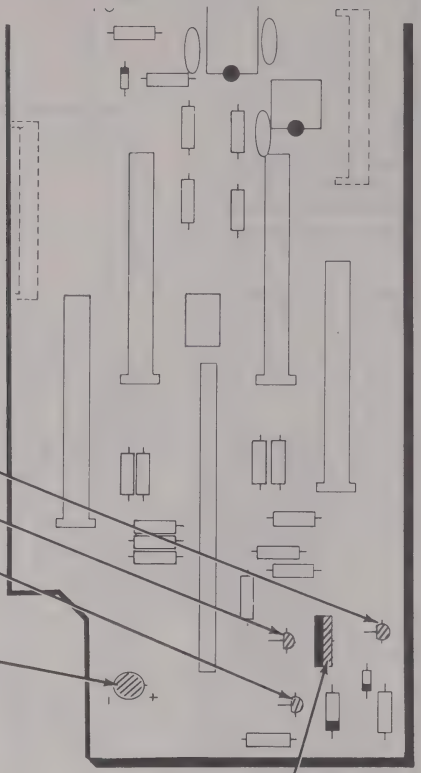
( ) Q212: 2N4121 (#417-235).

( ) Q213: MPSA20 (#417-801).

( ) Q215: MPSA20 (#417-801).

( ) Q214: 2N4121 (#417-235).

PICTORIAL 3-5



START

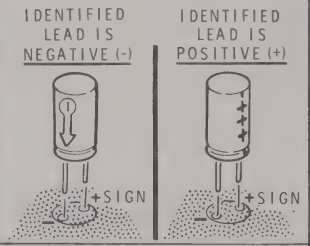
You will be working with the right half of the circuit board in the following steps.

( ) Q211: 2N4121 (#417-235).

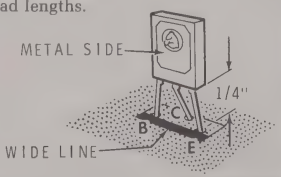
( ) Q207: MPSA20 (#417-801).

( ) Q216: MPSA20 (#417-801).

( ) C215: 10 μF electrolytic. Be sure to position the positive (+) marked **lead** in the positive (+) marked hole on the circuit board.



To install the following transistor, position the metal side of the transistor toward the wide line of the circuit board outline. Insert the leads in holes B, C, and E. Position the transistor 1/4" above the circuit board, solder the leads to the foil, and cut off the excess lead lengths.



Q208: MJE181 (#417-818).

PICTORIAL 3-6

START

You will be working with the left half of the circuit board in the following steps.

( ) C206: This capacitor is not used.

( ) C210: 470 pF ceramic.

( ) C204: 470 pF ceramic.

( ) C220: 470 pF ceramic.

( ) C205: 470 pF ceramic.

( ) C207: 470 pF ceramic.

( ) C230: 470 pF ceramic.

( ) C208: 470 pF ceramic.

( ) Solder the leads to the foil and cut off the excess lead lengths.

( ) C214: .1 μF ceramic. NOTE: Disregard any band that may be on this capacitor.

( ) C211: 4700 pF polystyrene.

( ) C202: This capacitor is not used.

( ) C213: .03 μF Mylar.

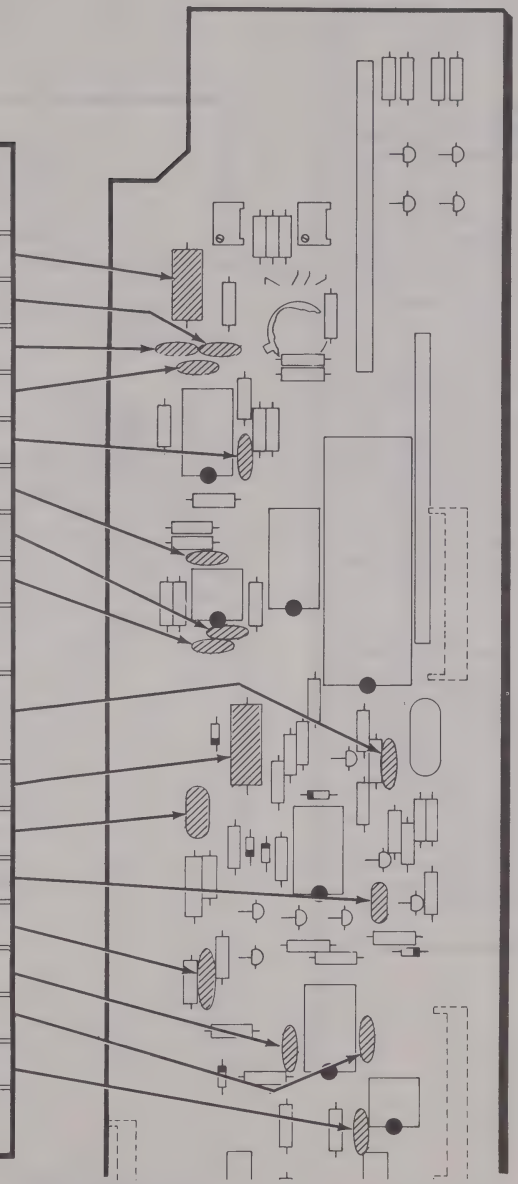
( ) C212: 75 pF ceramic.

( ) C203: 470 pF ceramic.

( ) C201: 470 pF ceramic.

( ) C209: 470 pF ceramic.

( ) Solder the leads to the foil and cut off the excess lead lengths.



PICTORIAL 3-7

START

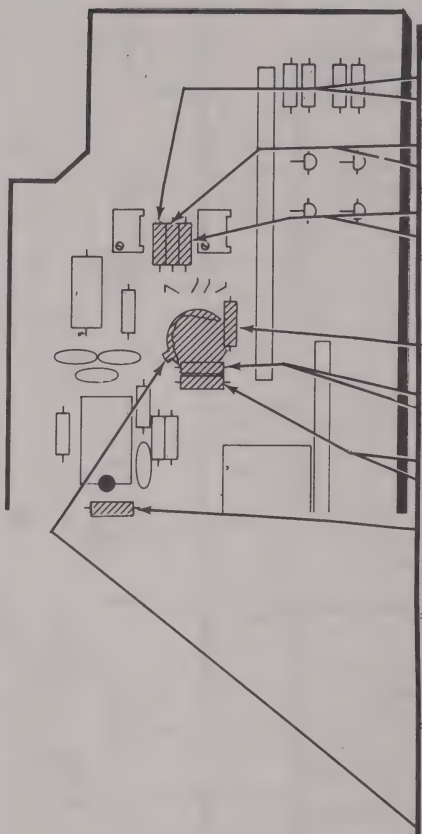
NOTE: The transducer supplied with your kit is one of two types. If your transducers look like the one shown here in Pictorial 3-8, refer to this Pictorial for the installation procedure. If your transducer looks like the one in Pictorial 3-9, refer to that Pictorial on Page 43 for the installation procedure.

You will be working with the left half of the circuit board in this Pictorial.

NOTE: The transducer you receive could be supplied as a single unit or with 1, 2, 3, or 4 of six possible resistors. These resistors will be identified by a color stripe, a different color for each resistor. This color is a code for a certain resistor number. Be sure to identify the resistors by COLOR and R-NUMBER , the following chart illustrates this.

COLOR	R-NUMBER
Red	R248
Blue	R249
Yellow	R251
Green	R254
White	R252
NO COLOR STRIPE	R253

The next few steps are in pairs, with two instructions for each part. For each of these parts (listed above), if you have that resistor, install it. If you do not have it, check off the alternate (no part) step.



PICTORIAL 3-8

CONTINUE

( ) R248: Red resistor.
( ) R248: No part.

( ) R252: White resistor.
( ) R252: 1" bare wire.

( ) R249: Blue resistor.
( ) R249: No part.

NOTE: There is no resistor for the next location. Use the following wire:

( ) R250: 1" bare wire.

( ) R254: Green resistor.
( ) R254: No part.

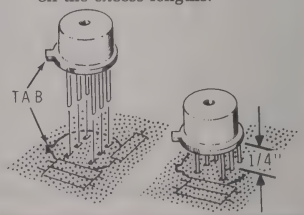
( ) R251: Yellow resistor.
( ) R251: Jumper wire.

( ) R253: Resistor (no solid color marking).

( ) Solder all leads to the foil and cut off the excess lengths.

NOTE: The Transducer may have a tight fitting cover for shipping protection, this cover must be removed for the component to work properly.

( ) A201: Transducer. To install it, line up the tab with the outline of the tab on the circuit board. Insert the leads and position the transducer 1/4" above the circuit board. Solder the leads to the foil and cut off the excess lengths.



Proceed to the top right hand column of Page 43.

START

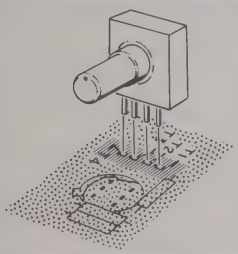
You will be working with the left half of the circuit board in this Pictorial.

( ) R248: No part.

( ) R252: No part.

( ) R249: No part.

( ) A201: Transducer. Position the transducer as shown. Insert the leads into the circuit board holes and solder the leads to the foil. Cut off the excess lead lengths.



( ) R250: 1" bare wire.

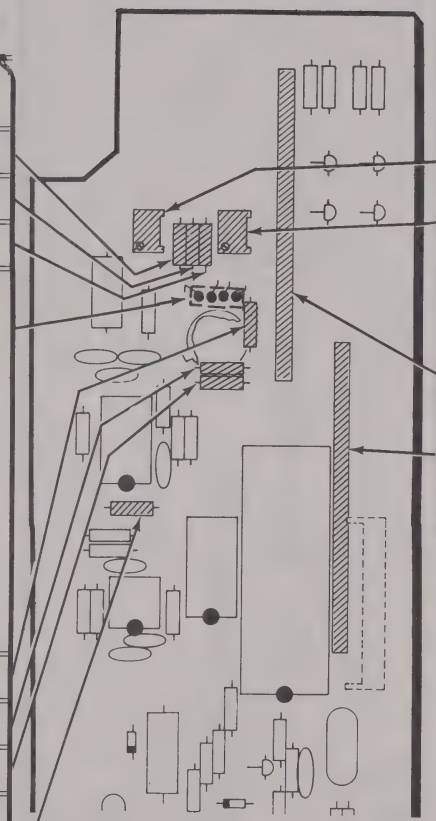
( ) R254: No part.

( ) R251: No part.

NOTE: The transducer supplied with your kit has one resistor. Install this resistor in the next step.

( ) R253: Resistor (no solid color marking).

( ) Solder the leads to the foil and cut off the excess lead lengths.



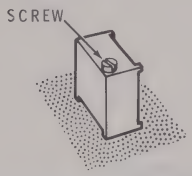
PICTORIAL 3-9

CONTINUE

Install the next two controls as follows:

1. Position the control with the small adjustment screw as shown.

   Insert the leads into the board, solder them to the foil, and cut off the excess length. Note the position of the screw.



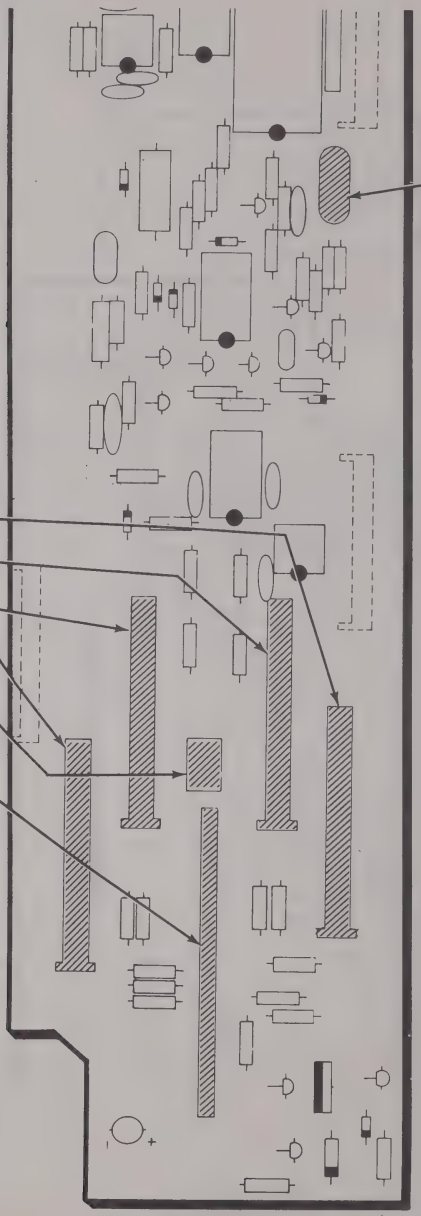
( ) R239: 10 kΩ (W 10k) miniature control (#10-1154).

( ) R241: 1000 Ω (W 1k) miniature control (#10-1153).

To install plugs, insert the short pins into the circuit board holes and solder the pins to the foil.

( ) P201: 25-pin plug.

NOTE: This plug is used in conjunction with the computer, which is explained in another section of the Manual. **Do not install a plug at this location.**



START

You will be working with the right half of the circuit board in the following steps.

( ) R205: 100 kΩ control (#10-959).

( ) R209: 10 kΩ control (#10-1073).

( ) R224: 10 kΩ control (#10-1073).

( ) R267: 100 kΩ control (#10-959).

( ) SW201: Insert the switch lugs into the circuit board holes and solder them to the foil.

( ) P206: 25-pin plug.

CONTINUE

( ) X201: 3579.545 kHz crystal. Solder the leads to the foil and cut off the excess lengths.

FINISH

PICTORIAL 3-10

START

Turn the circuit board over and position it foil side up as shown.

When you install each of the following sockets, be sure to position it so the side with the tabs is toward the right, as shown. Insert the lugs into the circuit board holes and solder them to the foil.

( ) S203: 14-pin socket.

( ) S204: 14-pin socket.

( ) S205: 14-pin socket.

( ) Locate a 10 μF electroltyic capacitor and cut both leads to 1/4".

NOTE: In the next step, make sure you position the plus (+) or minus (−) marked lead as shown.

( ) C216: Lay the 10 μF electrolytic capacitor flat against the foil side of the circuit board and solder the leads to the two indicated foil pads. There are no holes in the circuit board for the leads. Solder the leads directly to the foil.

CIRCUIT BOARD CHECKOUT

Carefully inspect the circuit board for the following conditions.

( ) Unsoldered connections.

( ) Poor solder connections.

( ) Solder bridges between foil patterns.

( ) Protruding leads which could touch together.

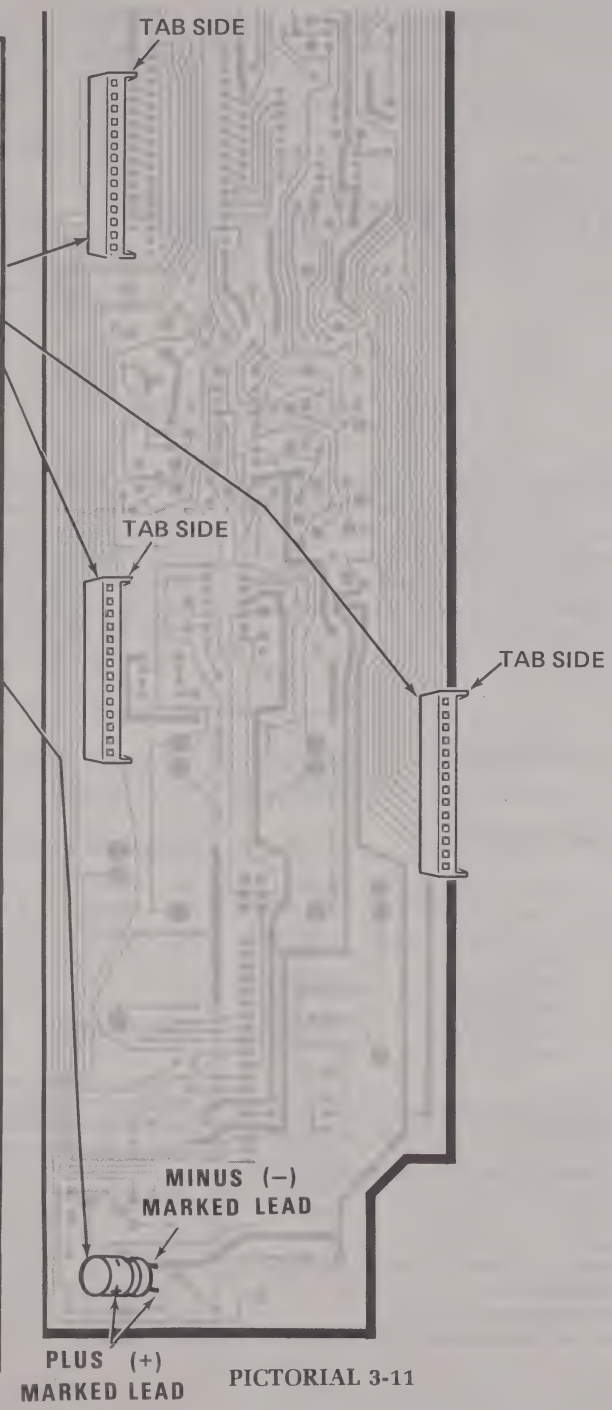
( ) Transistors for the proper type and installation.

( ) Electrolytic capacitor for the correct position of the positive (+) mark.

( ) Diodes for the correct position of the banded end.

NOTE: The integrated circuits will not be installed until after the initial test has been completed. Set the integrated circuits aside so you do not misplace them.

FINISH



PICTORIAL 3-11

FRONT PANEL/CHASSIS

PARTS LIST

Check all of the remaining parts against the following list and the Parts Pictorial (Illustration Booklet, Page 3). Any part that is packed in an individual envelope with the part number on it should be placed back in the envelope after you identify it until it is called for in a step. Do not discard any packing materials until all parts are accounted for.

To order a replacement part, always include the Part Number and use the Parts Order Form furnished with this kit. If a Parts Order Form is not available, use one of the "Expedited Parts Order Forms" at the rear of this Manual, or refer to "Replacement Parts" inside the rear cover. Your Warranty is inside the front cover. For pricing information, refer to the separate "Heath Parts Price List."

KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.
RESISTOR — CAPACITORS				
A1	6-225	1	2.2 MΩ (red-red-green) 1/2-watt, 5% resistor	R301
A2	21-71	2	.001 μF 1400-volt ceramic capacitor	C305, C306
A3	25-241	2	1200 μF electrolytic capacitor	C303, C304
A4	25-272	2	6000 μF electrolytic capacitor	C301, C302
INTEGRATED CIRCUIT				

NOTE: Integrated circuits are marked for identification in one of the following four ways:

1. Part number.
2. Type number. (This refers only to the numbers; the letters may be different.)
3. Part number and type number.
4. Part number with a type number other than the one listed.

KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.
Integrated Circuits (cont'd.)				
B1	442-54	1	UA7805	U301
B1	442-63	1	UA7815	U303
B1	442-613	1	MC7915P **or** 838 LM320T-15 **or** μA7915UC	U304
HARDWARE				

Hardware packets are marked to show the size of the hardware they contain (HDW #4, or HDW #2 & #6, etc.). You may have to open more than one packet — in this pack — to locate all the hardware of any one size (#6, for example).

#4 Hardware			
C1	250-391	2	4-40 × 5/16" black screw
C2	250-389	2	4-40 × 3/4" black screw
C3	250-1168	6	#4 × 1" self-tapping screw
C4	252-2	2	4-40 nut
C5	254-9	2	#4 lockwasher

HEATHKIT®

KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.
#6 Hardware				
D1	250-452	21	6-32 × 1/4″ black screw	
D2	250-56	2	6-32 × 1/4″ screw	
D3	250-587	3	6-32 × 5/16″ screw	
D4	250-270	6	6-32 × 3/8″ black screw	
D5	250-1101	3	6-32 × 3/8″ T-screw	
D6	250-365	3	#6 × 1/4″ sheet metal screw	
D7	250-475	8	#6 × 3/8″ sheet metal screw	
D8	255-735	8	6-32 × 9/16″ spacer	
D9	254-25	29	#6 lockwasher	
D10	253-2	1	#6 shoulder washer	
D11	259-1	3	#6 solder lug	
D12	252-80	1	6-32 cap nut	
D13	252-3	19	6-32 nut	
#8 Hardware				
E1	250-43	2	8-32 × 1/4″ setscrew	
E2	250-1186	2	8-32 × 3/8″ black screw	
E3	250-409	1	8-32 × 1/2″ self-tapping screw	
E4	250-286	2	8-32 × 1-1/4″ screw	
E5	254-2	2	#8 lockwasher	
E6	252-4	2	8-32 nut	
Other Hardware				
F1	255-80	2	Small spacer	
F2	253-712	4	C-ring	
F3	252-10	2	Speed Nut*	
F4	259-11	19	Spade lug	
F5	253-105	4	Large flat washer	
F6	252-149	4	Large nut	
F7	255-731	2	Large spacer	
F8	253-89	1	D-washer	
F9	260-56	2	Fuse clip	
F10	432-866	9	Connector	
Stainless Steel Hardware				
G1	250-235	8	6-32 × 1/4″ stainless steel screw	
G2	253-96	4	#6 stainless steel flat washer	
G3	252-77	2	6-32 stainless steel nut	
G4	250-328	1	8-32 × 3/8″ stainless steel screw	

KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.
TERMINAL STRIP — SOCKET				
H1	431-10	1	3-lug terminal strip	
H2	431-44	1	4-lug terminal strip	
H3	431-11	1	5-lug terminal strip	
H4	431-7	3	6-lug terminal strip	
H5	432-865	3	3-pin socket	
H6	432-948	2	25-hole socket	S201, S206
GENERAL				
J1	432-199	1	Wire nut	
J2	354-6	2	Cable tie	
J3	204-2280	3	L-bracket	
J4	73-79	1	U gasket	
J5	73-92	1	5″ gasket	
J6	261-44	4	Plastic foot	
J7	73-43	1	Plastic grommet	
J8	73-53	2	Rubber grommet	
J9	207-18	1	Plastic clamp	
J10	75-71	1	Line cord strain relief	
J11	75-152	1	Plastic insulator	
J12	75-746	1	Fiber insulator	
J13	421-31	1	3/16-ampere slow-blow fuse	F301
J14	352-13	1	Silicone grease	
J15	54-959	1	Power transformer	T301
J16	490-5	1	Nut starter	
J17	205-778	1	1/8″ × 1″ metal strip	
J18	253-713	1	Round Seal	
CHASSIS — CABINET				
K1	200-1295-1	1	Chassis	
K2	203-1895-1	1	Front panel	
K3	203-2070-1	1	Display cover	
K4	204-2259	2	Side bracket	
K5	205-1721	1	Trim plate	
K6	391-92	1	Nameplate	
#305-72 SET OF CABINET PARTS, CONSISTING OF THE FOLLOWING:				
L1	94-586	1	Left side block	
L2	94-587	1	Right side block	
L3	94-588	1	Front block	

*Registered Trademark, Tinnerman Co.

KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.

WIRE — CABLE — HARNESS — SLEEVING — LINE CORD

344-114	4′	White-brown wire
344-115	4′	White-red wire
344-116	4′	White-orange wire
344-158	4′	White-yellow wire
344-15	6″	Black wire
344-16	6″	Red wire
344-79	6″	Brown wire
344-80	6″	Orange wire
344-81	6″	Violet wire
347-55	7″	8-wire flat cable
100-1728	1	Indoor temperature sensor with 10′ cable
100-1727	1	Outdoor temperature sensor with 70′ cable
134-1029	1	27-lead harness
134-1030	1	20-lead harness
346-60	1	Clear tubing (1-1/2″)
89-23	1	Line cord

NOTE: To operate your Digital Weather Computer, you will need a length of 8-wire lead-in cable to connect between the weather sensing instruments outside your residence and the weather indicating instruments on the inside. This cable, if you do not already have it, is available from the Heath Company in 50′, 100′, or 150′ lengths.

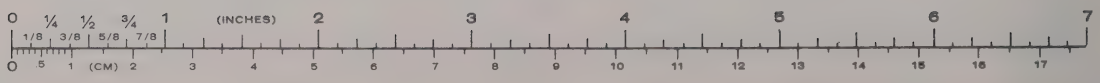
KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.

WIND SENSOR PARTS

M1	142-712	1	Boom
M2	214-208	2	Top housing
M3	214-209	2	Bottom housing
M4	266-930	1	Wind vane
M5	266-939	1	Wind cup
M6	266-942	1	Wind vane cap
M7	266-1032	2	Encoder disc
M8	266-943	1	Counter weight
M9	453-282	2	1/8″ × 3″ shaft
M10	455-643	4	Bearing

#142-711 SET OF BOOM PARTS, CONSISTING OF THE FOLLOWING:

N1	142-713	1	U-bolt
N2	142-714	2	U-bolt nut
N3	142-715	1	U-bolt housing
N4	142-716	1	U-bolt grip plate
N5	142-717	2	End cap



STEP-BY-STEP ASSEMBLY
Front Panel Assembly

Refer to Pictorial 4-1 for the following steps.

Place a cloth on your work surface where you are working with assemblies that are painted and could get scratched.

( ) Position the front block as shown and install the nameplate with two push-on Speed Nuts.

( ) Install the front block on the front panel with three #6 × 1/4" sheet metal screws. Center the block between the sides of the panel before you tighten the screws.

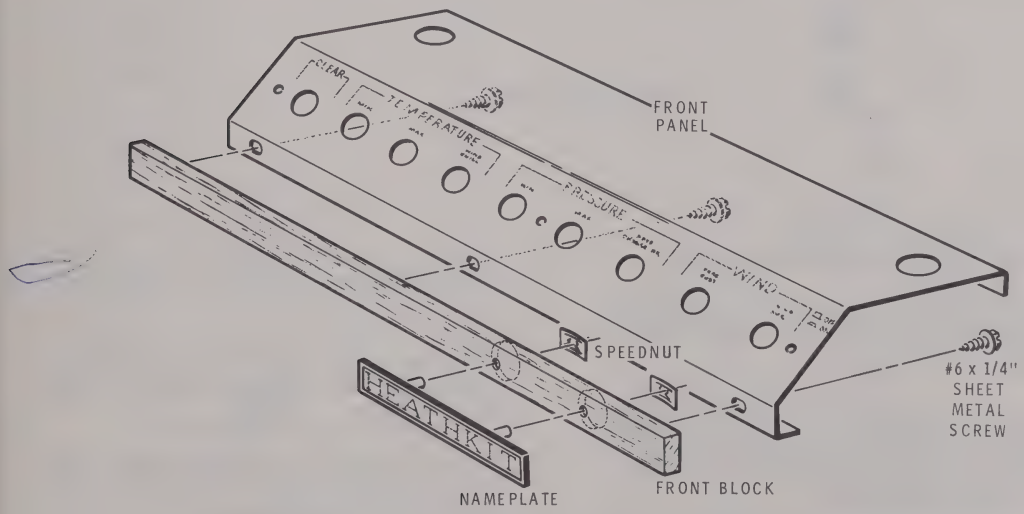
Refer to Pictorial 4-2 (Illustration Booklet, Page 5) for the following steps.

NOTE: Use the nut starter supplied with this kit to hold and start 4-40 and 6-32 nuts on screws.

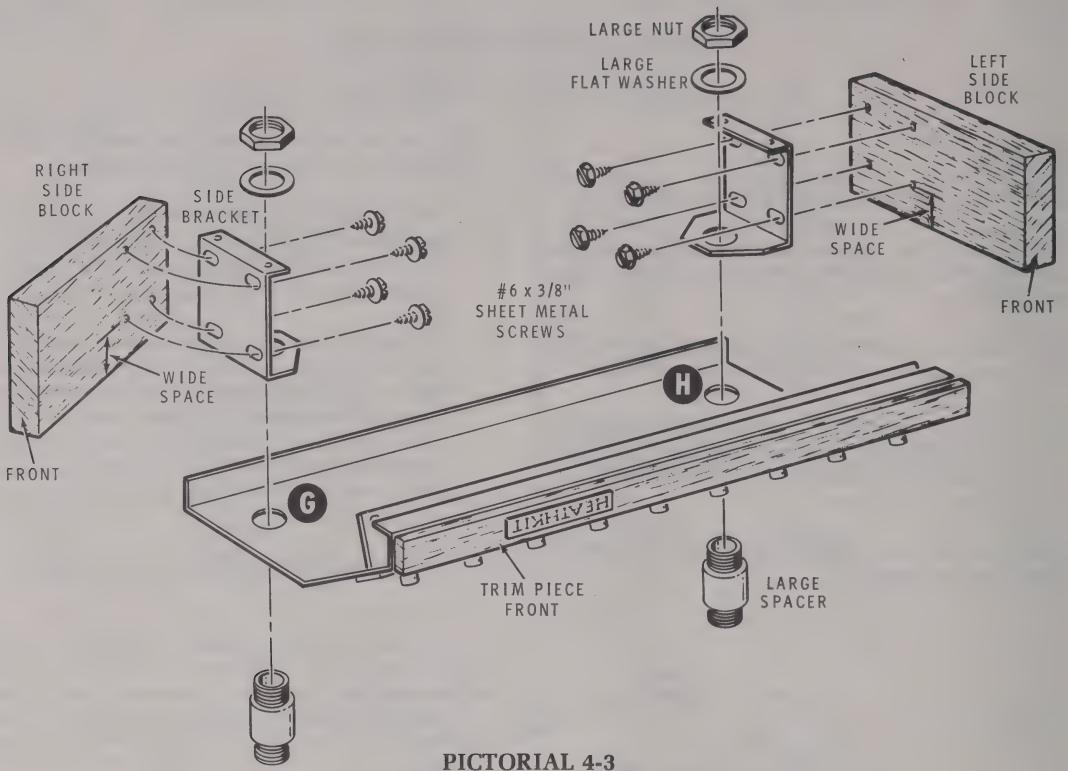
( ) Position the front panel circuit board as shown and mount L-brackets at D, E, and F with 6-32 × 5/16" screws, #6 lockwashers, and 6-32 nuts. Do not tighten the hardware at this time.

( ) Position the trim plate with the groove side up and slide three 6-32 × 3/8" T-screws in the groove. Line up the screws with holes A, B, and C in the front panel and mount the trim plate and circuit board on the front panel. Use #6 lockwashers and 6-32 nuts. Center the trim plate on the front panel and tighten the screws at A, B, and C.

( ) Tighten the L-bracket hardware at D, E, and F.



PICTORIAL 4-1



PICTORIAL 4-3

Refer to Pictorial 4-3 for the following steps.

NOTE: To identify which is the right side and left side block, note the location of the four holes and the wide space called out in the Pictorial.

( ) Position one of the side brackets so the large hole is pointing down. Loosely mount the bracket on the left side block with four #6 × 3/8" sheet metal screws.

( ) Mount this assembly on the front panel with a large spacer, flat washer, and nut at H.

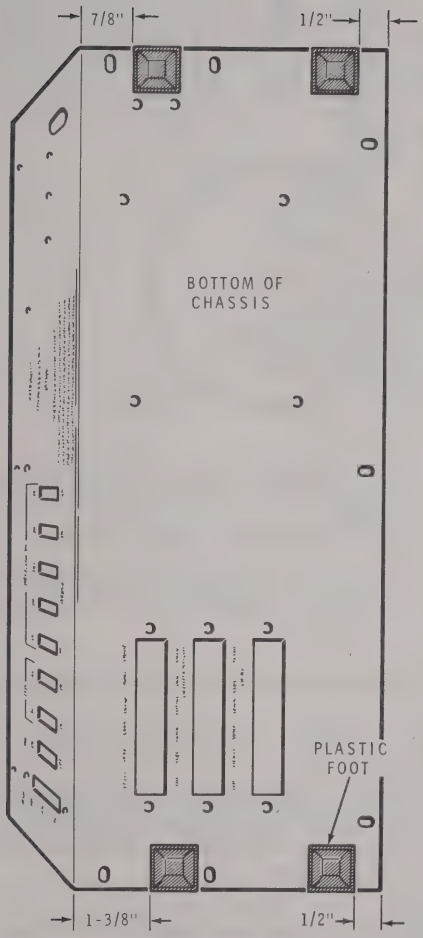
( ) Similarly mount the other side bracket to the right side block and mount that assembly to the front panel at G.

( ) Align the left and right side blocks with the front of the trim piece and tighten the side bracket screws.

( ) Refer to Pictorial 4-4 (Illustration Booklet, Page 5) and mount the display housing on the large spacers with large flat washers and nuts.

Set this assembly aside temporarily.

Chassis Parts Mounting



Detail 5-1A

Refer to Detail 5-1A for the following step.

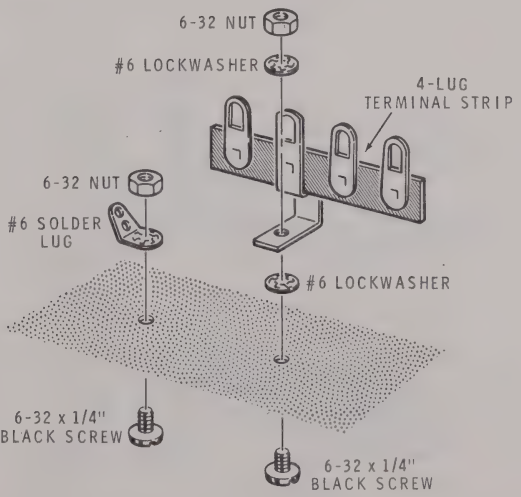
( ) Position the chassis as shown. Then peel the covering from the four plastic feet and install one at each corner of the chassis at the locations shown.

( ) Refer to Pictorial 5-1 (Illustration Booklet, Page 6) and reposition the chassis for the following steps. The Pictorial shows the location of the parts that are mounted while the Details show how to mount them.

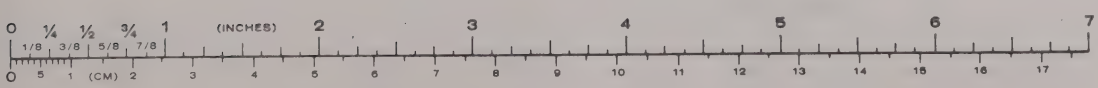
Refer to Detail 5-1B for the following steps.

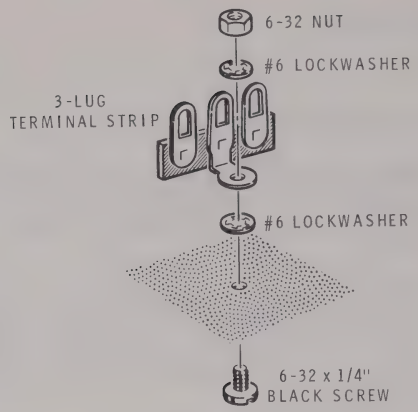
( ) Mount a #6 solder lug at J with a 6-32 × 1/4" black screw and 6-32 nut.

( ) Mount a 4-lug terminal strip at K with a 6-32 × 1/4" black screw, two #6 lockwashers, and a 6-32 nut.



Detail 5-1B



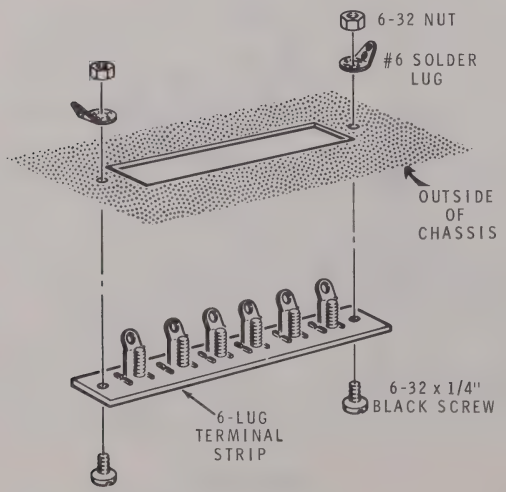


Detail 5-1C

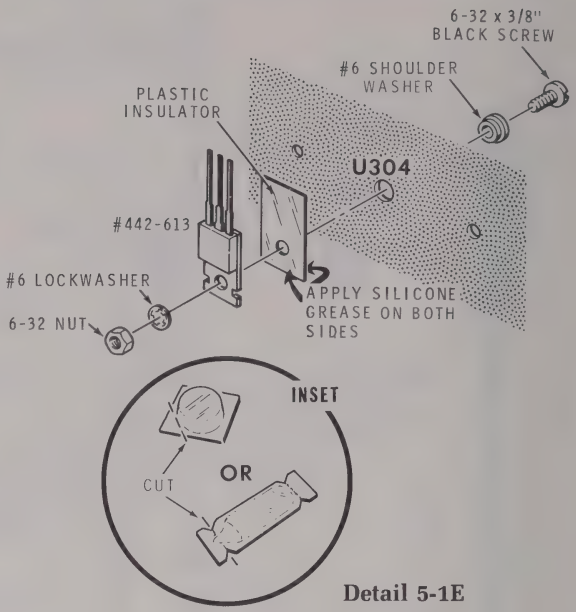
( ) Refer to Detail 5-1C and mount a 3-lug terminal strip at R with a 6-32 × 1/4" black screw, two #6 lockwashers, and a 6-32 nut.

( ) Similarly mount the 5-lug terminal strip at P. Be sure to position the terminal strip as shown in the Pictorial.

NOTE: In the next step, be sure you mount the terminal strip on the **outside** of the chassis.



Detail 5-1D



Detail 5-1E

( ) Refer to Detail 5-1D and mount a 6-lug terminal strip at T with two 6-32 × 1/4" black screws,two #6 solder lugs, and two 6-32 nuts.

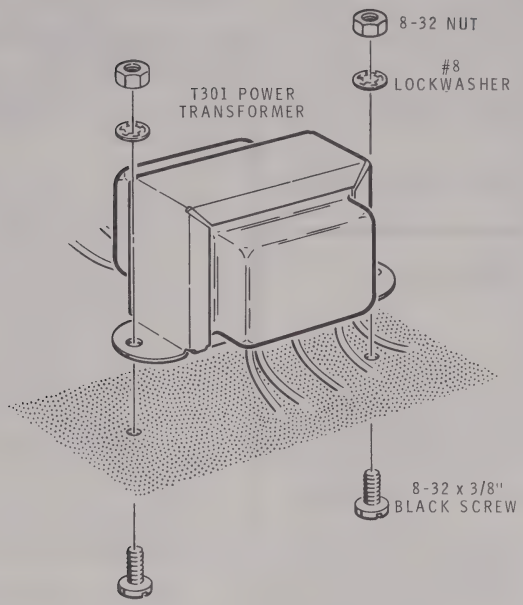
( ) Mount a 6-lug terminal strip at S. Use two 6-32 × 1/4" black screws, two #6 lockwashers, and two 6-32 nuts.

( ) Similarly mount a 6-lug terminal strip at U.

Refer to Detail 5-1E for the following steps.

( ) Locate the MC7915P or 838-LM320T-15 or μA7915UC integrated circuit (#442-613). Also locate the plastic insulator and the container of silicone grease.

WARNING: The silicone grease you will use in the following step(s) helps transfer heat from the transistor to the heat sink. The grease is not caustic, but make sure you do not get it into your eyes, ears, nose, mouth, or on your clothing. Always wash your hands after you use the grease. Keep this and all chemicals out of the reach of children.



Detail 5-1F

( ) Refer to the inset drawing and open the container of silicone grease. Apply a layer of grease to both sides of the plastic insulator. Now place the insulator on the metal side of the IC.

( ) Mount the IC at U304 with a 6-32 × 3/8″ black screw, #6 shoulder washer, #6 lockwasher, and 6-32 nut. Make sure the shoulder washer seats in the chassis hole and the IC lugs are vertical. Then tighten the hardware.

( ) Apply a layer of silicone grease on the metal side of the UA7805 IC (#442-54). Mount the IC at U301 with only a 6-32 × 1/4″ black screw, #6 lockwasher, and 6-32 nut.

( ) Similarly mount the UA7815 IC (#442-63) at U303.

( ) Discard the silicone grease container.

( ) T301: Refer to Detail 5-1F and mount the power transformer with 8-32 × 3/8″ black screws, #8 lockwashers, and 8-32 nuts. Be sure to position the side with the five leads as shown.

Chassis Wiring

Two sets of line voltage wiring instructions are given below, one for 120 VAC line voltage and the other for 240 VAC line voltage. In the U.S.A., 120 VAC is most often used, while in foreign countries 240 VAC is more common. USE ONLY THE INSTRUCTIONS THAT AGREE WITH THE LINE VOLTAGE IN YOUR AREA.

120 VAC Wiring

Refer to Detail 6-1A for the following steps.

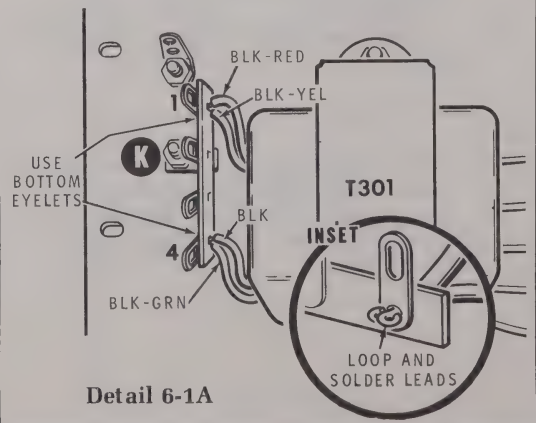
NOTES:

1. Insert the transformer leads in the bottom hole of the terminal strip lugs and form a small loop in the bare wire ends when you are instructed to connect them. Refer to the inset drawing.

2. In the following steps, (NS) means not to solder because other wires will be added later. "S-" with a number, such as (S-3), means to solder the connection. The number following the "S" tells how many wires are at the connection.

( ) Black-red and black-yellow leads to lug 1 of terminal strip K (S-2).

( ) Black and black-green leads to lug 4 of terminal strip K (S-2).



Detail 6-1A

For 220/240 volt operation, you must change the plug on the line cord to the appropriate type specified by your local electrical code.

240 VAC Wiring

Refer to Detail 6-1B for the following steps.

NOTES:

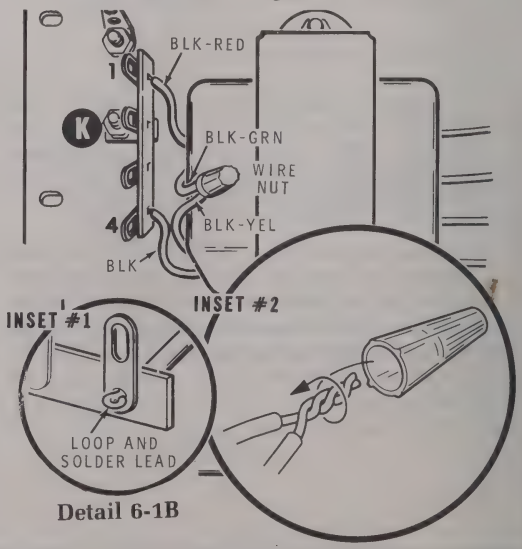
1. Insert the transformer leads in the bottom hole of the terminal strip lugs and form a small loop in the bare wire ends when you are instructed to connect them. Refer to inset drawing #1.

2. In the following steps, (NS) means not to solder because other wires will be connected later. "S-" with a number, such as (S-3), means to solder the connection. The number following the "S" tells how many wires are at the connection.

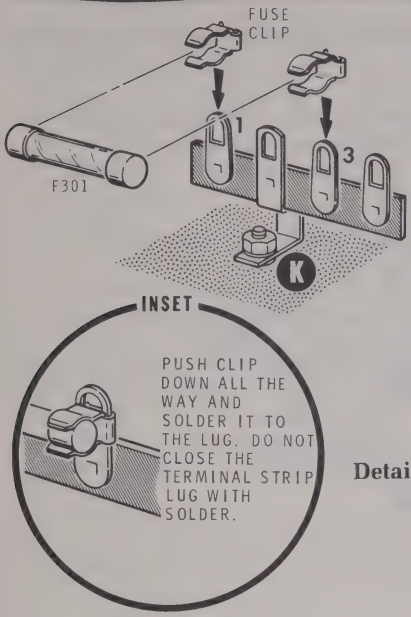
( ) Black-red lead to lug 1 of terminal strip K (S-1).

( ) Black lead to lug 4 of terminal strip K (S-1).

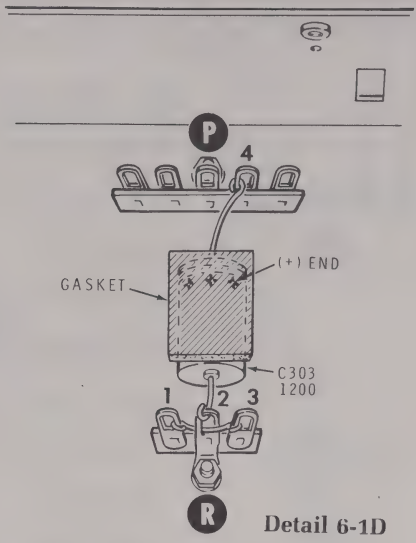
( ) Twist the ends of the black-green and black-yellow leads together in a clockwise direction. Then turn the wire nut also in a clockwise direction onto these leads. See the inset drawing. Position these leads against the chassis.



Detail 6-1B



Detail 6-1C



Detail 6-1D

Refer to Pictorial 6-1 (Illustration Booklet, Page 6) for the following steps.

Refer to Detail 6-1C for the following two steps.

( ) Place a fuse clip on each end of the fuse so they are flush with the ends.

( ) Slide the clips on lugs 1 and 3 of terminal strip K. See the inset drawing. Solder the clips to the lugs, but do not close the lug hole with solder. After the clips cool, remove the fuse and set it aside.

( ) C305: Connect a .001 μF ceramic capacitor between lugs 1 (S-1) and 2 (NS) of terminal strip K.

( ) C306: Connect a .001 μF ceramic capacitor between lugs 2 (NS) and 4 (NS) of terminal strip K.

( ) R301: Connect a 2.2 MΩ (red-red-green) resistor between lugs 2 (S-3) and 4 (NS) of terminal strip K.

Refer to Detail 6-1D for the following four steps.

NOTE: When a wire passes through a connection and then goes to another point, as in the next step, it will count as two wires in the solder instructions (S-2); one entering and one leaving the connection.

( ) Connect a 1-1/4" bare wire from lug 1 (NS) through lug 2 (NS) to lug 3 (NS) of terminal strip R.

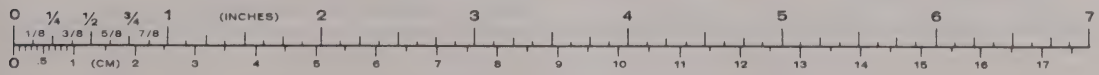
( ) C303: Connect the positive (+) lead of a 1200 μF electrolytic capacitor to lug 4 of terminal strip P (NS) and the other lead to lug 2 of terminal strip R (NS).

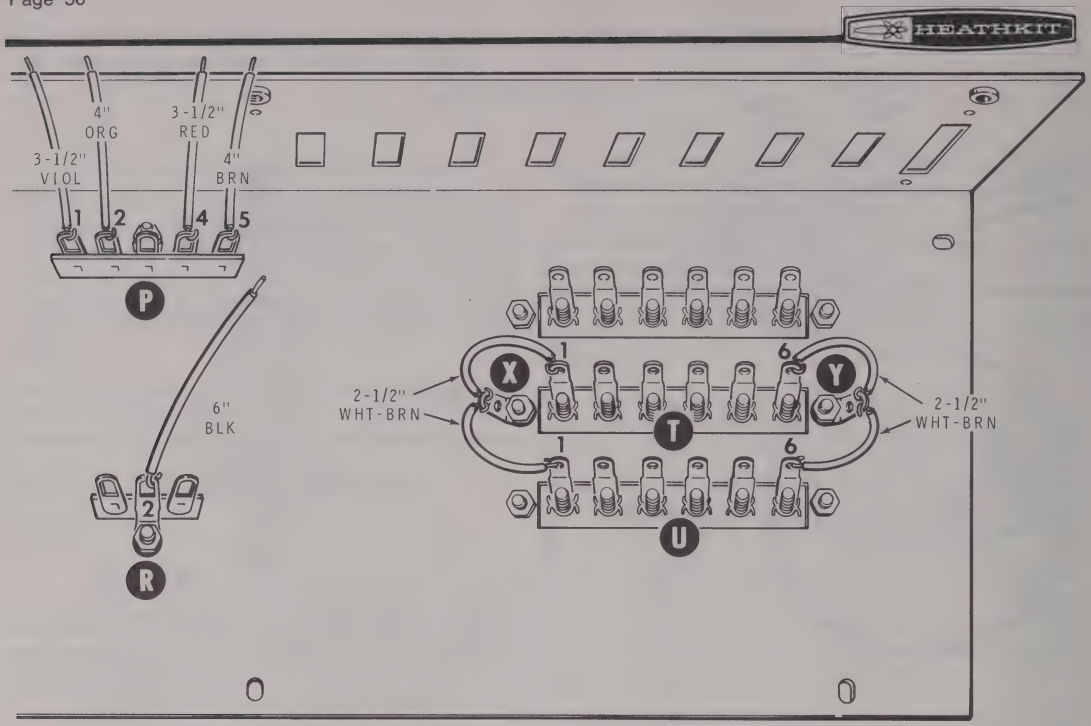
( ) Cut a 1-5/8" piece of gasket. Then remove the paper backing from one side of it and place a gasket on top of the capacitor you just installed. Then remove the other paper backing.

( ) C304: Place the other 1200 μF electrolytic on top of the gasket. Connect the positive (+) lead to lug 2 of terminal strip R (NS) and the other lead to lug 2 of terminal strip P (NS).

( ) C301: Connect the positive (+) lead of a 6000 μF capacitor to lug 1 of terminal strip P (NS). Connect the other lead to lug 1 of terminal strip R (S-2).

( ) C302: Connect the positive (+) lead of the other 6000 μF capacitor to lug 5 of terminal strip P (NS). Connect the other lead to lug 3 of terminal strip R (S-2).





PICTORIAL 6-2

Refer to Pictorial 6-2 for the following steps.

NOTE: You will be instructed to prepare wires ahead of time as in the following steps. To prepare the wire, cut it to the indicated length, remove 1/4" of insulation from the ends, twist the fine strands and apply a small amount of solder on the ends. The wires are listed in the order in which they will be used.

( ) Prepare the following lengths of wire:

3-1/2" violet
4" orange
3-1/2" red
4" brown

Connect one end of these wires to terminal strip P in the following steps. The free ends will be connected later.

( ) Violet to lug 1 (S-2).

( ) Orange to lug 2 (S-2).

( ) Red to lug 4 (S-2).

( ) Brown to lug 5 (S-2).

( ) Connect one end of a 6" black wire to terminal strip R lug 2 (S-5). Make sure all five of these leads get soldered. The other end of the black wire will be connected later.

( ) Prepare the following lengths of wire:

Four 2-1/2" white-brown.

Connect the prepared wires in the following steps.

( ) White-brown from lug 1 of terminal strip U (S-1) to solder lug X (NS).

( ) White-brown from lug 1 of terminal strip T (S-1) to solder lug X (NS).

( ) White-brown from lug 6 of terminal strip T (S-1) to solder lug Y (NS).

( ) White-brown from lug 6 of terminal strip U (S-1) to solder lug Y (S-2).

Set the chassis aside temporarily.

Refer to Pictorial 7-1 (Illustration Booklet, Page 7) for the following steps.

( ) Locate harness #134-1030. Unfold the harness and straighten the wires at each breakout. A breakout is where a group of wires comes from the harness.

( ) Set the harness aside temporarily.

( ) Locate harness #134-1029. Unfold the harness and straighten the wires at each breakout.

Refer to Pictorial 7-2 (Illustration Booklet, Page 8) for the following steps.

( ) Position the front panel/display housing assembly on your work surface as shown.

( ) Very carefully insert breakout #3 of harness #134-1029 through the large spacer at H. Insert a few wires at a time until all of the connectors are through the spacer.

Refer to Detail 7-2A (Illustration Booklet, Page 9) for the following steps.

In the following steps, you will insert the wire harness connectors into a 25-hole socket. Insert them as follows:

1. Position the socket with the slotted side up.

2. Position the connector so the small tab is also up. Then push the connector into the socket hole until it snaps in place. If you have to remove a connector from a hole for any reason, first push the small tab down with a screwdriver and then pull the wire and connector out.

Insert the connectors in the following steps:

( ) White-blue in hole 19.

( ) White-black in hole 18.

( ) White-brown in hole 17.

( ) White-red in hole 16.

( ) White-violet in hole 15.

( ) White-gray in hole 14.

( ) White-orange in hole 13.

( ) White-green in hole 12.

( ) White-yellow in hole 11.

( ) Violet in hole 10.

( ) Blue in hole 9.

( ) Gray in hole 8.

( ) White in hole 7.

( ) Black in hole 6.

( ) Brown in hole 5.

( ) Green in hole 4.

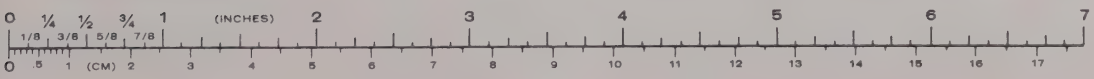
( ) Yellow in hole 3.

( ) Red in hole 2.

( ) Orange in hole 1.

This completes the installation of these connectors.

( ) Refer to Pictorial 7-2 and very carefully insert breakout #3 of harness #134-1030 through the large spacer at G. Insert a few wires at a time until all of the connectors are through the spacer.



Refer to Detail 7-2B (Illustration Booklet, Page 9) for the following steps.

( ) Position the remaining 25-hole socket with the slot side up.

Insert the connectors into the socket in the following steps:

( ) **Large** violet in hole 20.

( ) White-brown in hole 19.

( ) Green in hole 18.

( ) White-red in hole 17.

( ) White-yellow in hole 16.

( ) White-green in hole 15.

( ) White-gray in hole 14.

( ) White-orange in hole 13.

( ) **Small** violet in hole 12.

( ) White-black in hole 11.

( ) Gray in hole 10.

( ) **Small** brown in hole 9.

( ) **Small** red in hole 8.

( ) Yellow in hole 7.

( ) Orange in hole 6.

( ) **Large** black in hole 5.

( ) White-blue in hole 4.

( ) **Large** red in hole 3.

( ) White-violet in hole 2.

( ) **Large** brown in hole 1.

( ) This completes the installation of these connectors. Route this harness to the right side so it will not interfere with the next steps.

Refer to Pictorial 7-2 (Illustration Booklet, Page 8) for the following steps. Connect the wires coming from breakout #2 of harness #134-1029 to the front panel circuit board in the following steps. Solder the wires to the foil as they are installed and cut off the excess lengths.

( ) White-blue to hole AA.

( ) Both gray to holes AC.

( ) Both violet to holes AD.

( ) Both blue to holes AE.

( ) Both yellow to holes AF.

( ) Both green to holes AJ.

( ) Both orange to holes AP.

( ) Both red to holes AS.

( ) Both brown to holes AU.

( ) Both black to holes AT.

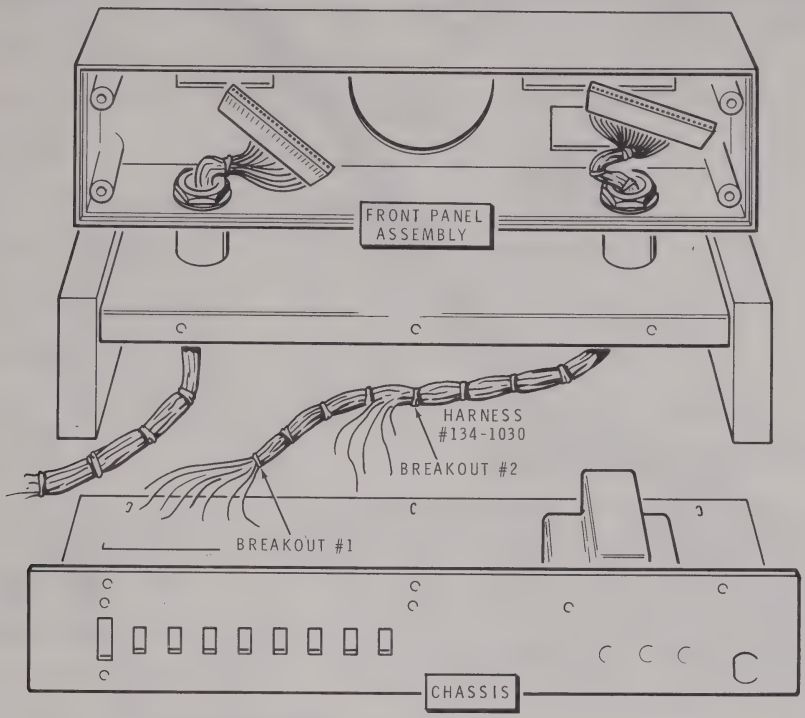
( ) Wrap a cable tie around the wires at the green pair and the blue pair, pull them tight, and cut off the excess. See the inset drawing.

( ) Shake out any loose clippings that may be lodged in the front panel.

( ) Route the wires at breakout #1 to the left side so they will not interfere with the following steps.

Refer to Pictorial 7-3 (Illustration Booklet, Page 10) for the following steps.

( ) Refer to Detail 7-3A and position the chassis behind the front panel assembly. The wires at breakout #1 and one wire at breakout #2 of harness #134-1030 will be connected next.



Detail 7-3A

Connect the black wire from breakout #2 of harness #134-1030 in the following step. The other wires will be connected later.

( ) Black wire to lug 3 of terminal strip P (S-1).

Connect the wires from breakout #1 of harness #134-1030 to terminal strips S, T, and U in the following steps.

TERMINAL STRIP S

( ) Small brown to lug 1 (S-1).

( ) Red to lug 2 (S-1).

( ) Orange to lug 3 (S-1).

( ) Yellow to lug 4 (S-1).

( ) Green to lug 5 (S-1).

( ) Blue to lug 6 (S-1).

TERMINAL STRIP T

( ) White-red to lug 2 (S-1).

( ) White-brown to lug 3 (S-1).

( ) White-blue to lug 4 (S-1).

( ) White to lug 5 (S-1).

( ) Large brown to solder lug at X (S-3).

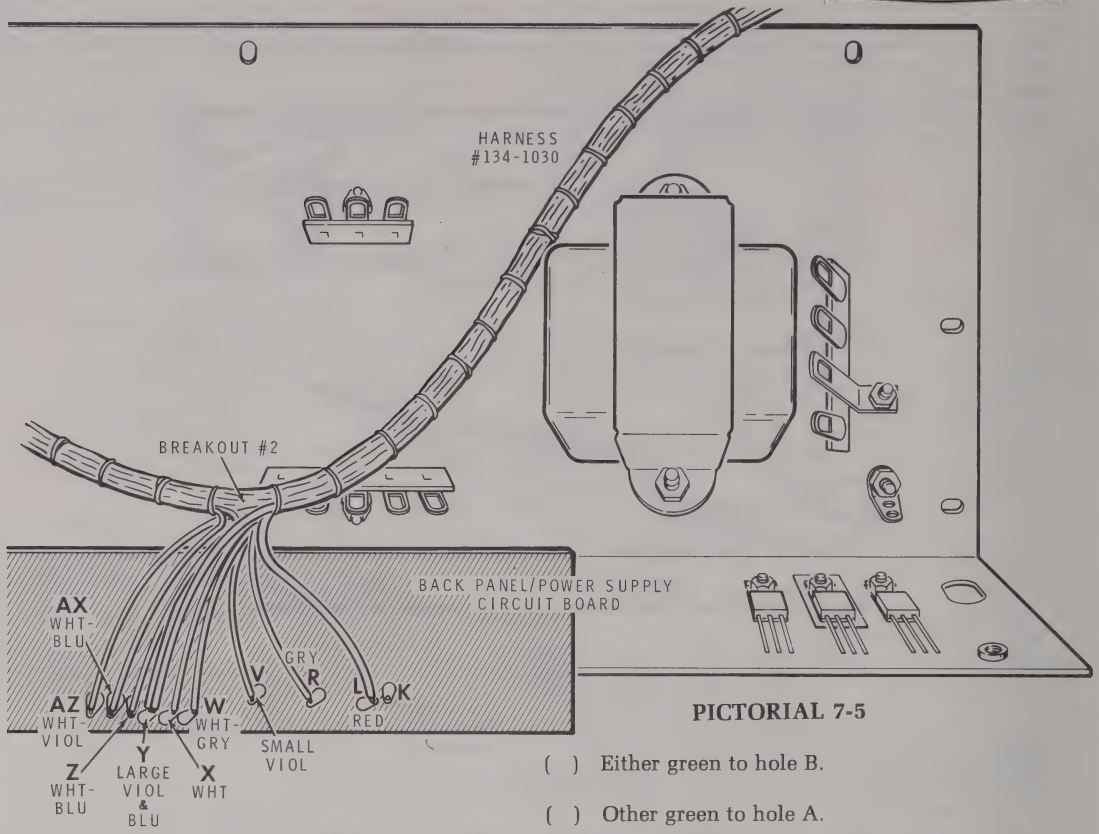
TERMINAL STRIP U

( ) White-black to lug 2 (S-1).

( ) White-green to lug 3 (S-1).

( ) White-yellow to lug 4 (S-1).

( ) White-orange to lug 5 (S-1).



PICTORIAL 7-5

Refer to Pictorial 7-4 (Illustration Booklet, Page 10) for the following steps.

( ) Position the back panel/power supply circuit board as shown and place it on the inside of the chassis against the back panel. You will be working with both sides of the board in the following steps.

Connect the wires coming from transformer T301 and terminal strip P to the circuit board in the following steps. Always solder to the back side of the board, not the component side. Cut off the excess length that protrudes from the board.

FROM TRANSFORMER T301

( ) Yellow to hole E.

( ) Either red to hole D.

( ) Other red to hole C.

( ) Either green to hole B.

( ) Other green to hole A.

FROM TERMINAL STRIP P

( ) Brown to hole AY.

( ) Red to hole M.

( ) Orange to hole S.

( ) Violet to hole G.

FROM TERMINAL STRIP R

( ) Black to hole F.

Refer to Pictorial 7-5 for the following steps.

Connect the wires coming from breakout #2 of harness #134-1030 to the back panel/power supply circuit board in the following steps.

( ) Do not install a wire in hole K.

( ) Red to hole L.

( ) Gray to hole R.

( ) Small violet to hole V.

( ) White-gray to hole W.

( ) White to hole X.

( ) Large violet and blue wires, both to hole Y.

( ) Either white-blue to hole Z.

( ) Other white-blue to hole AX.

( ) White-violet to hole AZ.

Refer to Pictorial 7-6 for the following steps.

Connect the wires coming from breakout #1 of harness #134-1029 to the back panel/power supply circuit board in the following steps.

( ) White-black to hole AA.

( ) White to hole AB.

( ) Gray to hole AC.

( ) Violet to hole AD.

( ) Blue to hole AE.

( ) Green to hole AF.

( ) White-green to hole AG.

( ) White-yellow to hole AH.

( ) Yellow to hole AJ.

( ) White-violet to hole AK.

( ) White-orange to hole AL.

( ) White-red to hole AM.

( ) White-brown to hole AN.

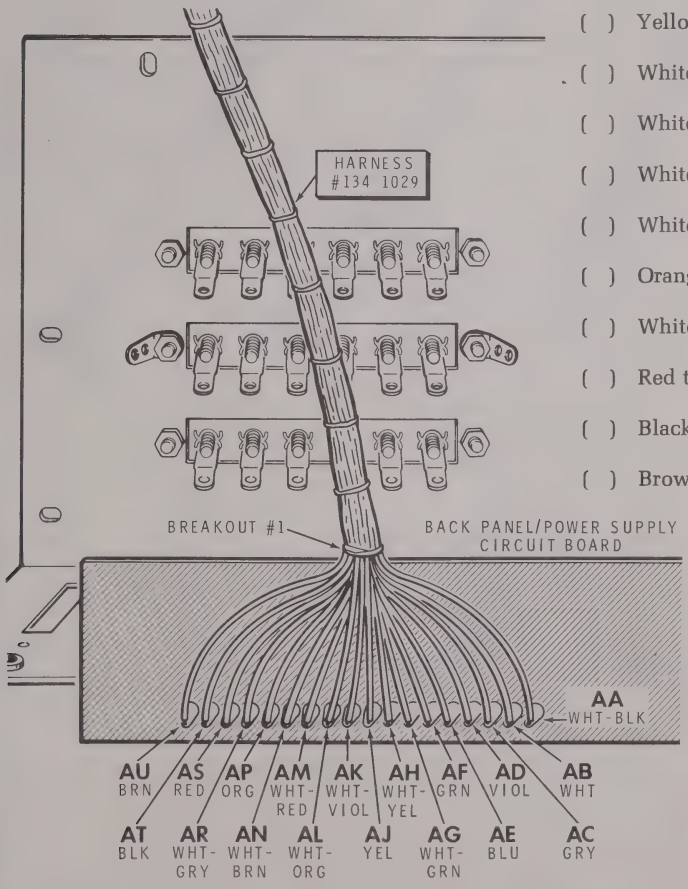
( ) Orange to hole AP.

( ) White-gray to hole AR.

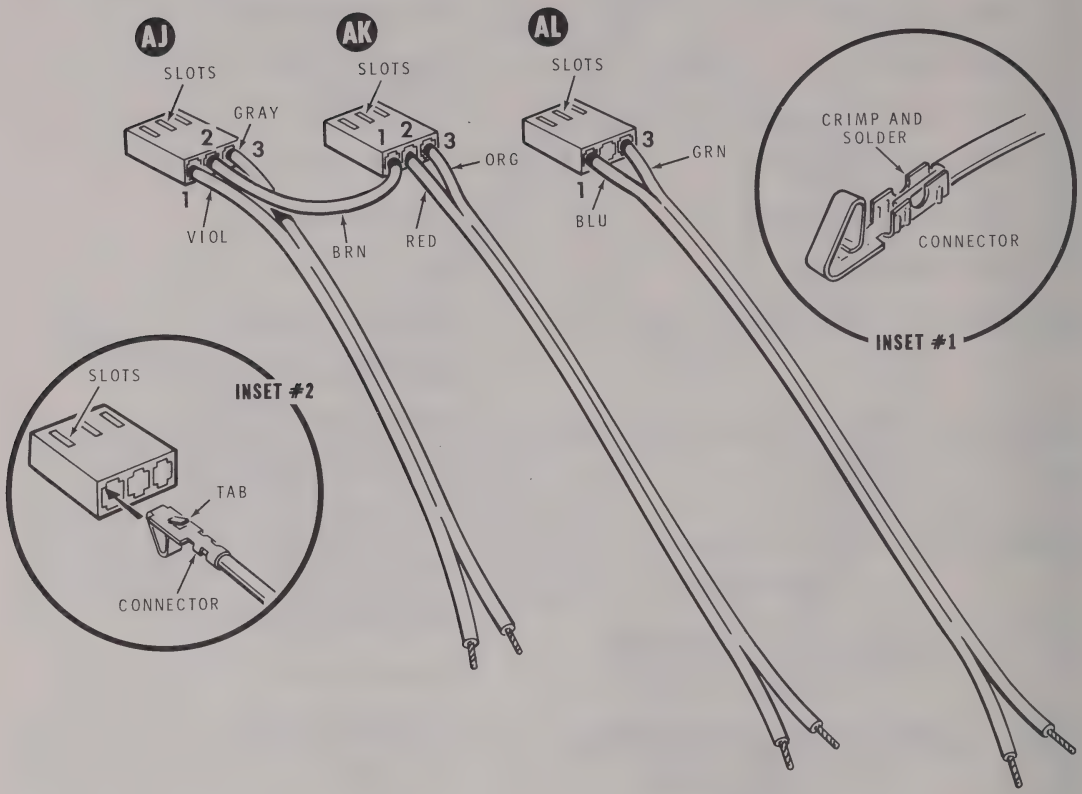
( ) Red to hole AS.

( ) Black to hole AT.

( ) Brown to hole AU.

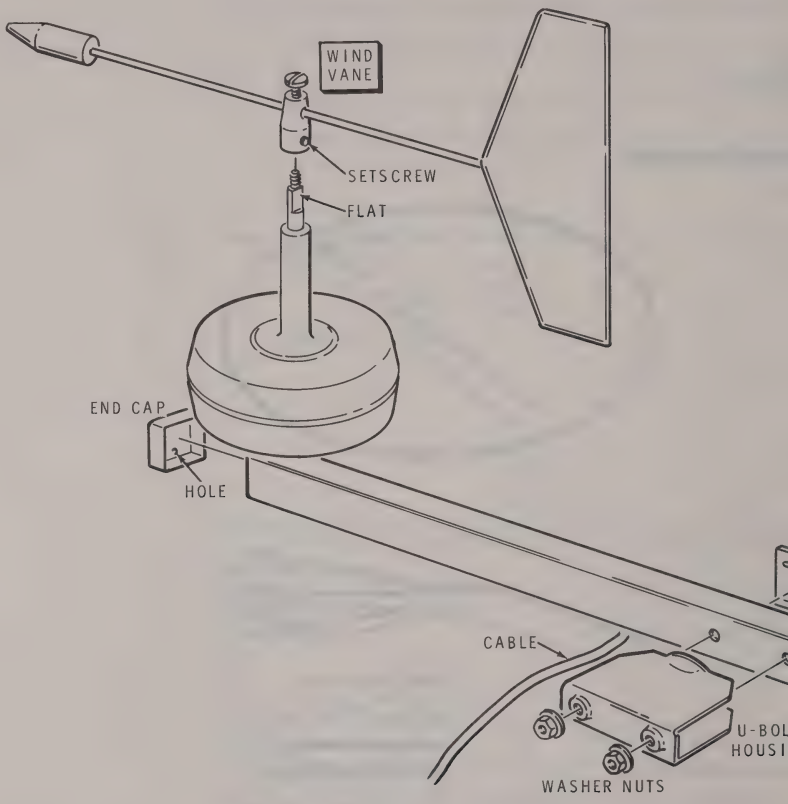


PICTORIAL 7-6

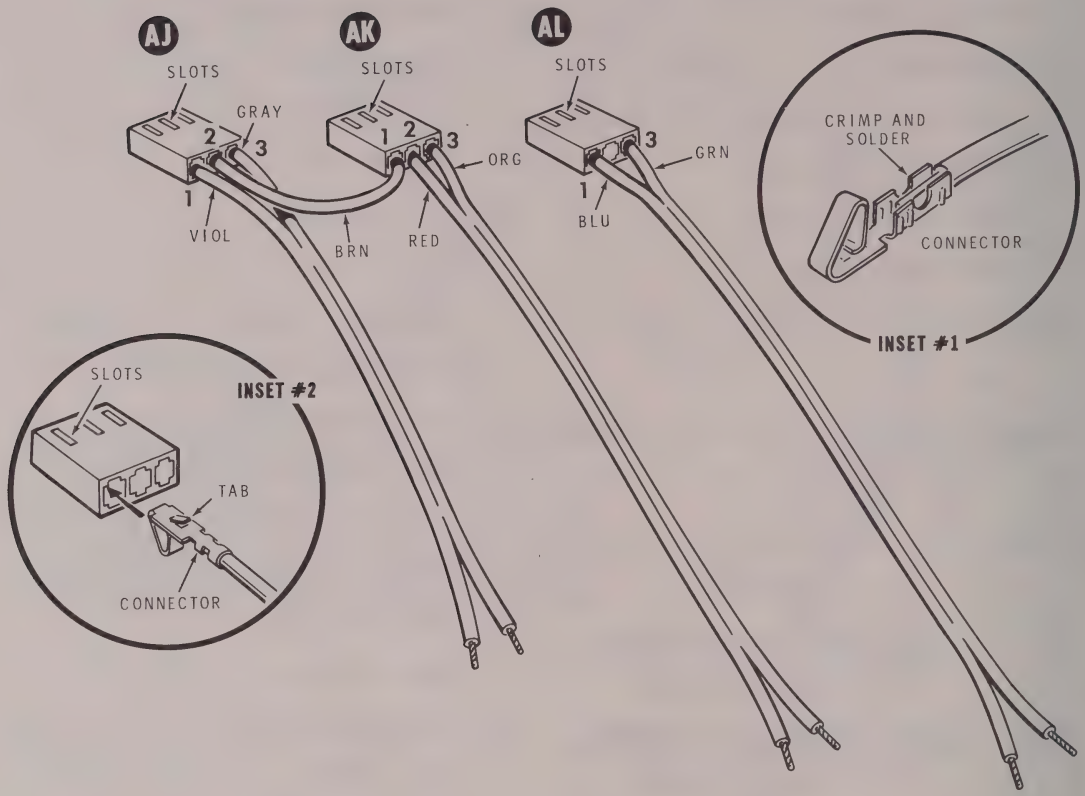


PICTORIAL 7-7

ILLUSTRAT

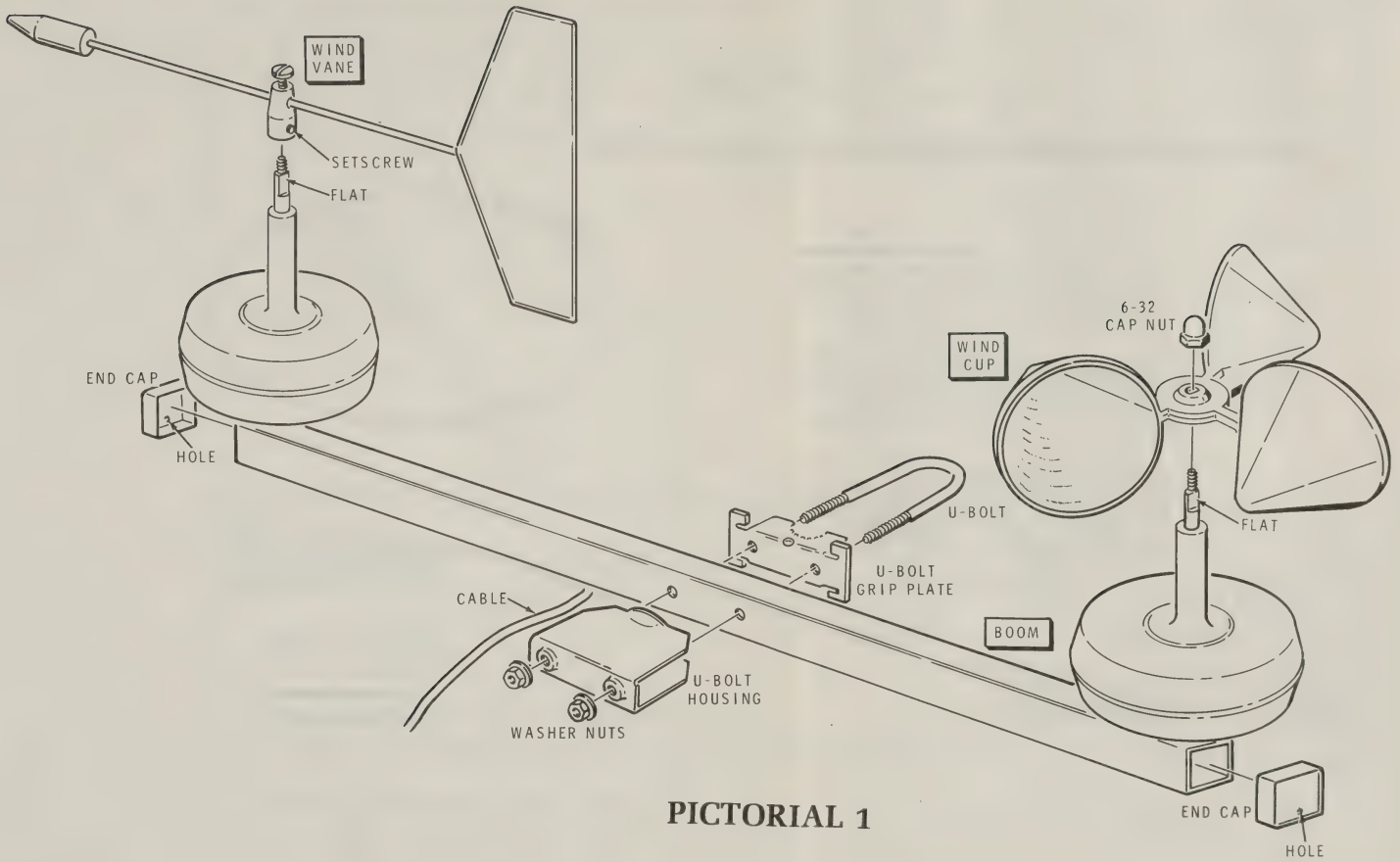


PICT



PICTORIAL 7-7

ILLUSTRATION BOOKLET



PICTORIAL 1

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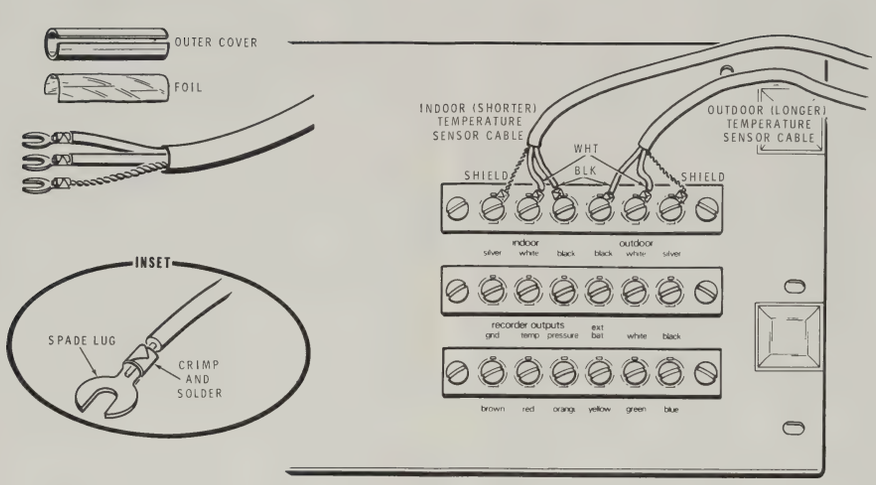

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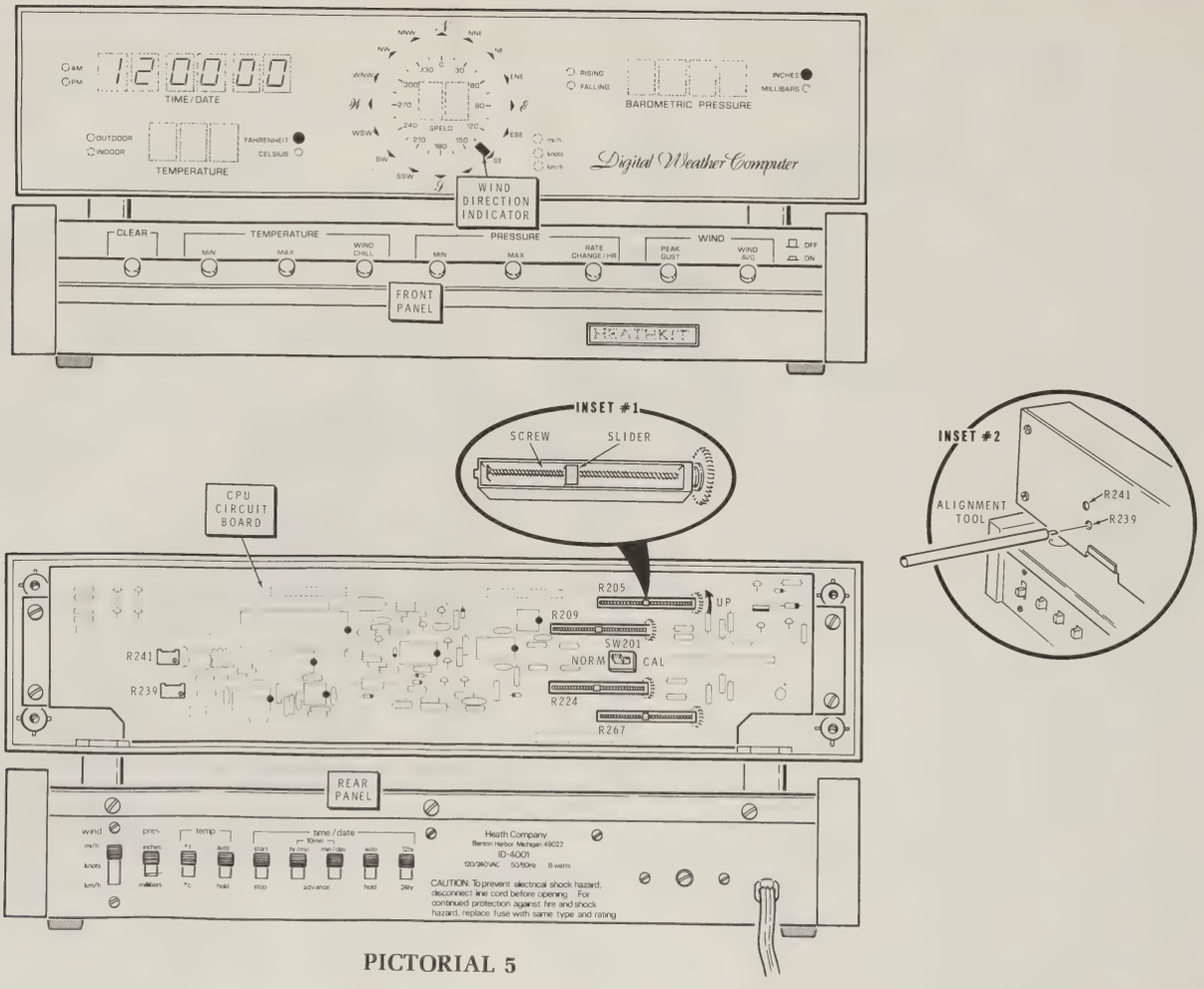

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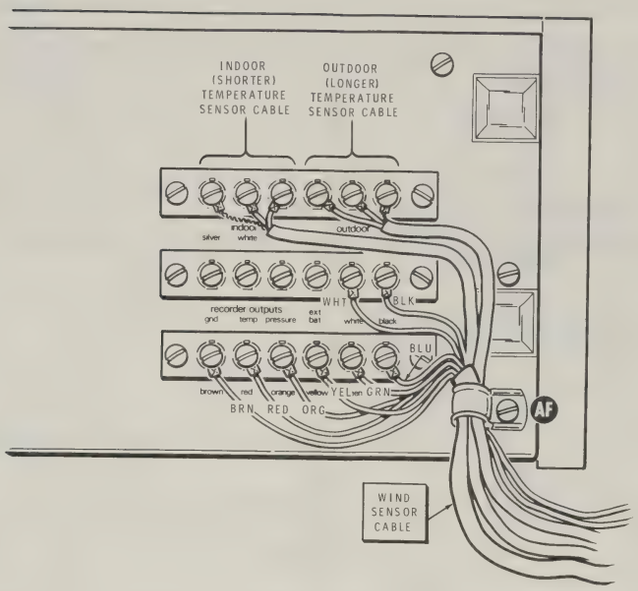

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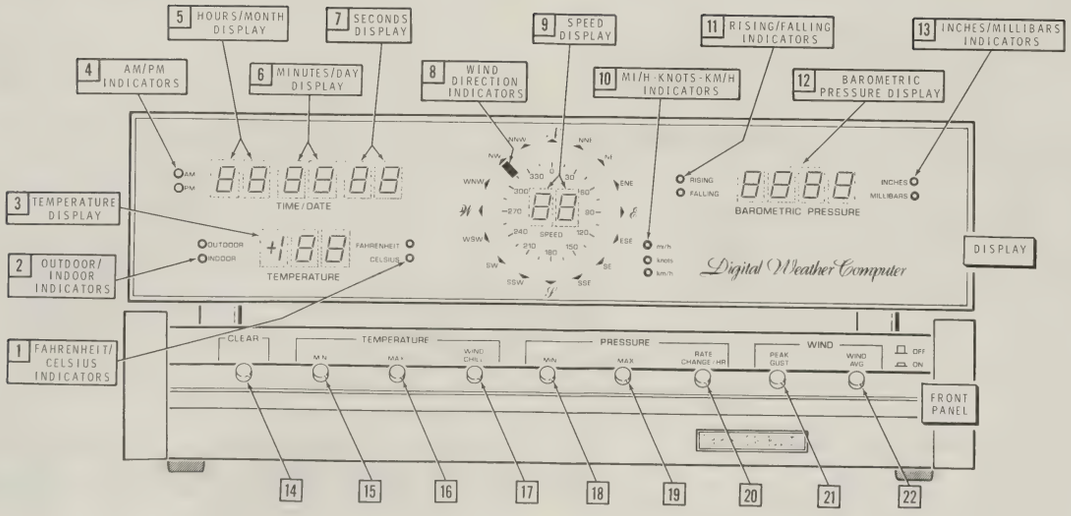
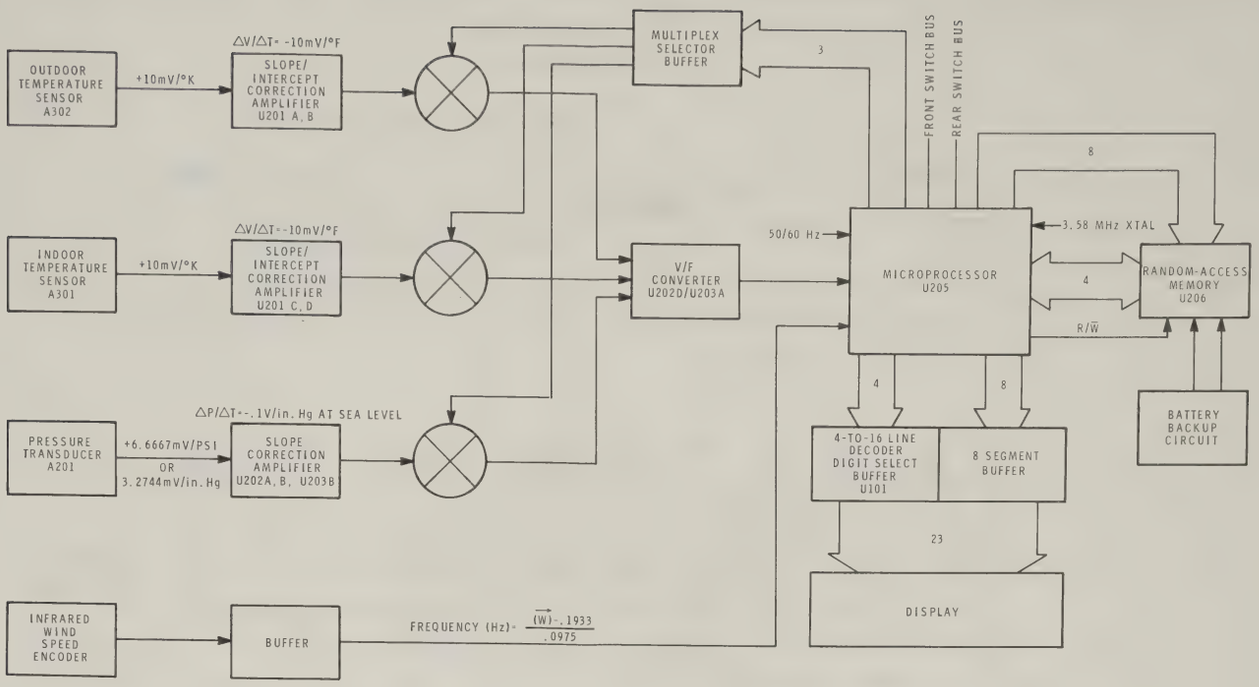
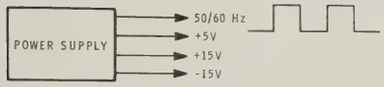


PICTORIAL 12



BLOCK DIAGRAM



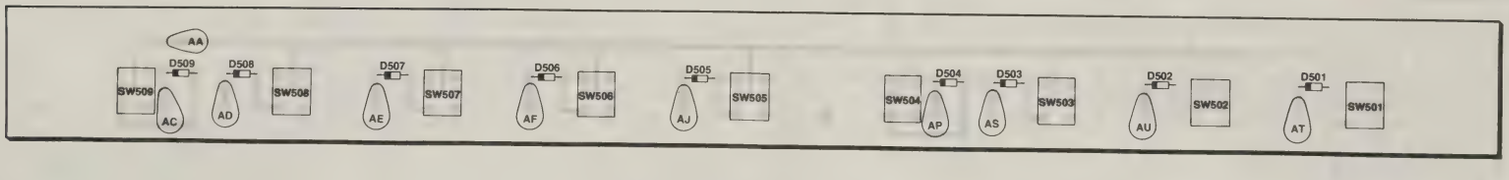
CIRCUIT BOARD X-RAY VIEWS

NOTE: To find the PART NUMBER of a component for the purpose of ordering a replacement part:

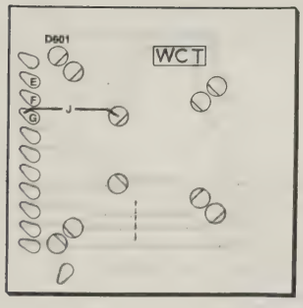
A. Find the circuit component number (R5, C3, etc.) on the "X-Ray View."

B. Locate this same number in the "Circuit Component Number" column of the "Parts List."

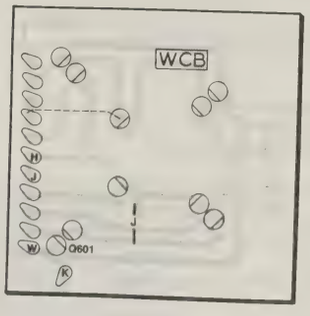
C. Adjacent to the circuit component number, you will find the PART NUMBER and DESCRIPTION which must be supplied when you order a replacement part.



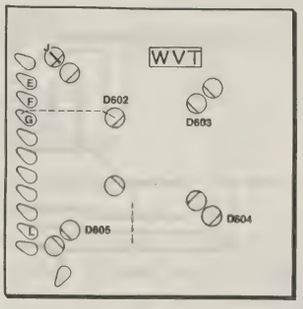
FRONT PANEL SWITCH CIRCUIT BOARD
(Shown from component side.)



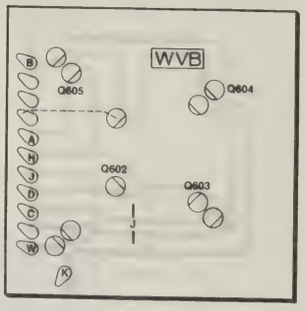
TOP WIND SPEED SENSOR CIRCUIT BOARD
(Shown from component side.)



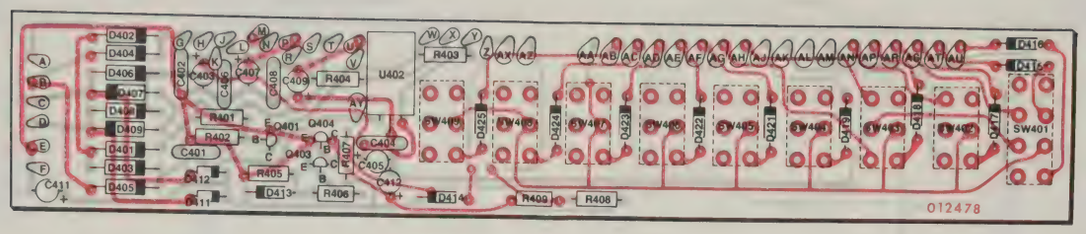
BOTTOM WIND SPEED SENSOR CIRCUIT BOARD
(Shown from component side.)



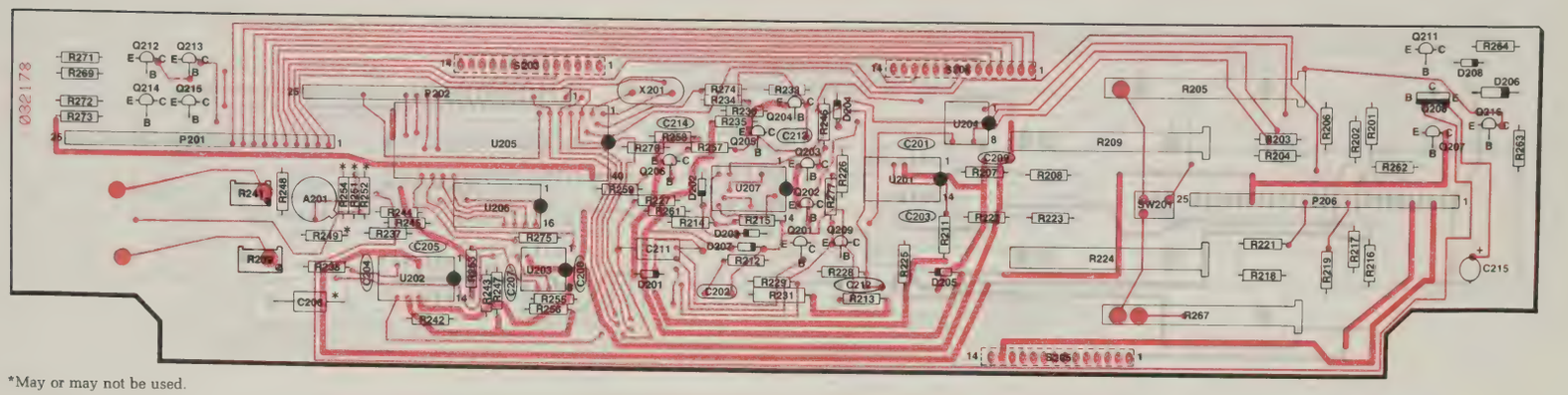
TOP WIND DIRECTION SENSOR CIRCUIT BOARD
(Shown from conponent side.)



BOTTOM WIND DIRECTION SENSOR CIRCUIT BOARD
(Shown from component side.)

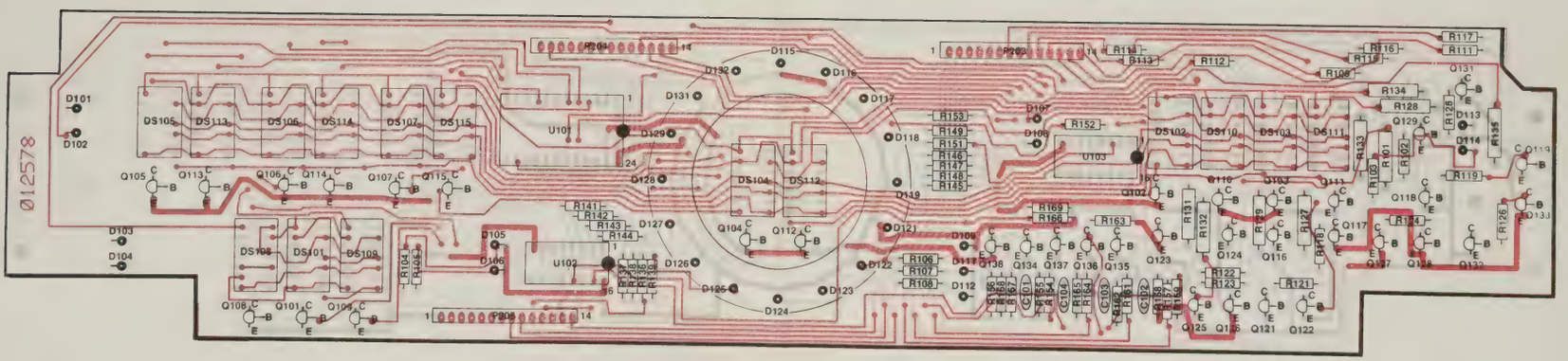


POWER SUPPLY/BACK PANEL CIRCUIT BOARD
(Shown from component side.
Foil on component side is shown in red.)



*May or may not be used.

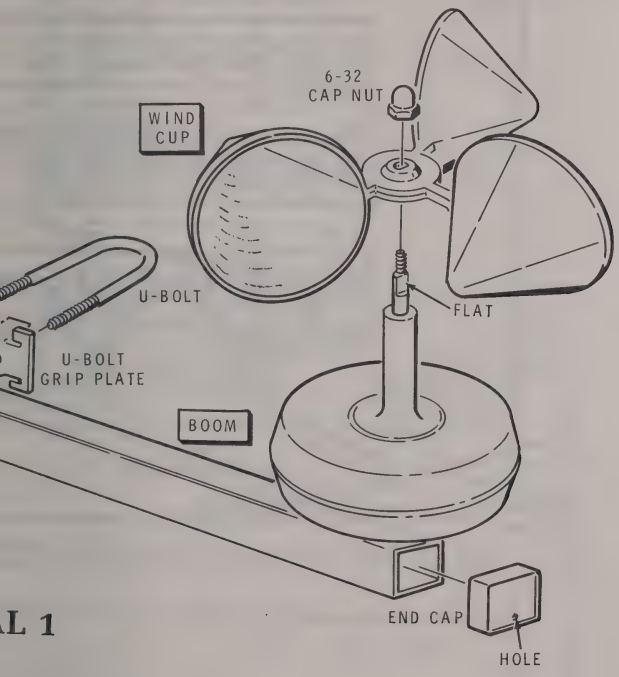
CPU CIRCUIT BOARD
(Shown from component side.
Foil on component side is shown in red.)



DISPLAY CIRCUIT BOARD
(Shown from component side.
Foil on component side is shown in red.)

N BOOKLET

Part of 595-2186



AL 1

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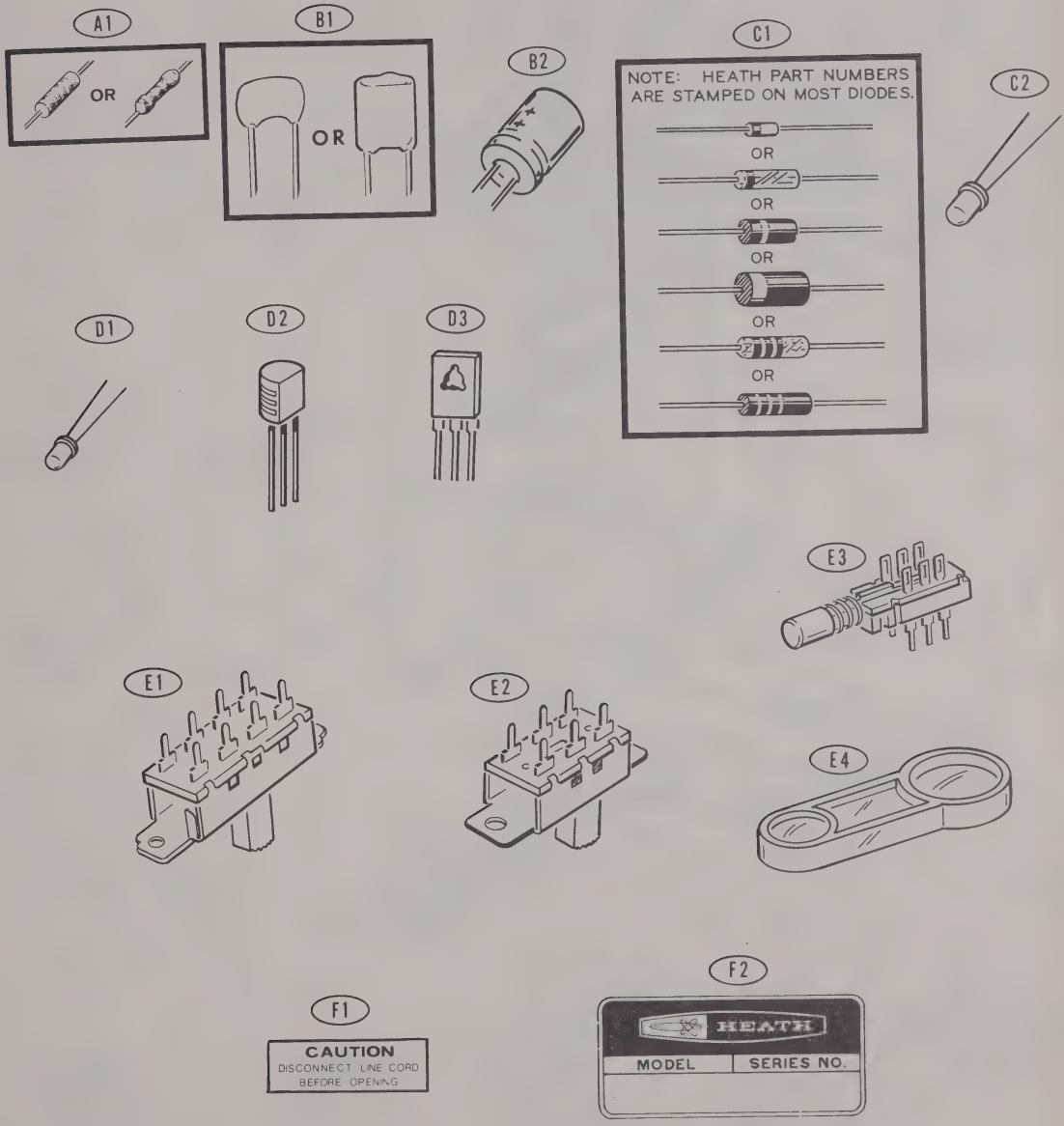
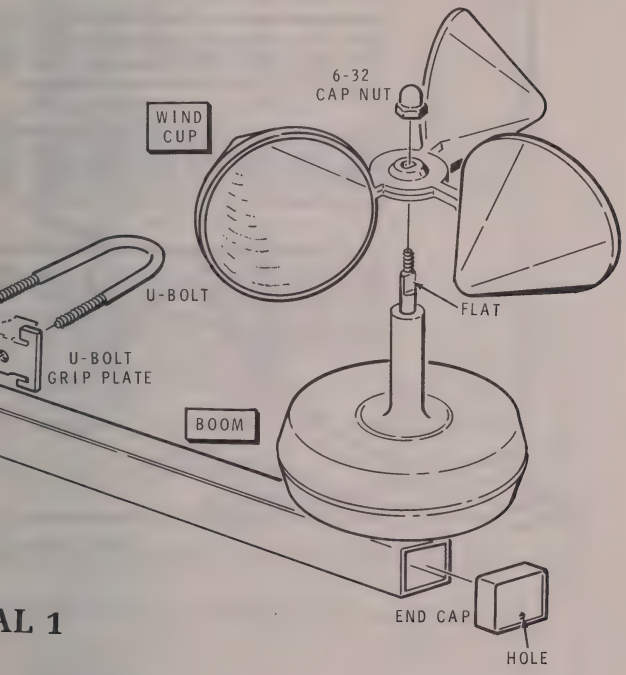
PARTS PICTORIAL #1



N BOOKLET

Part of 595-2186



AL 1

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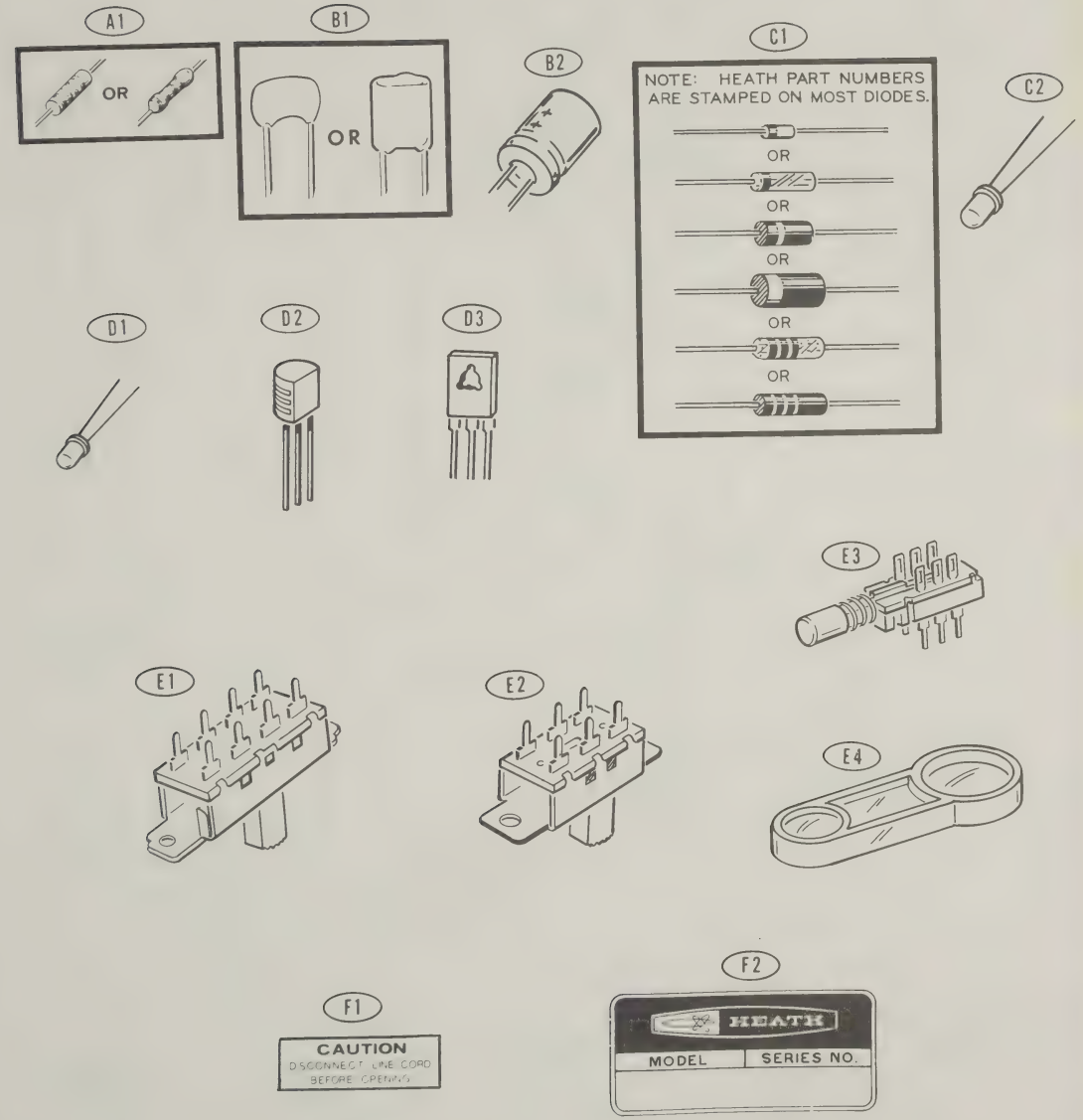
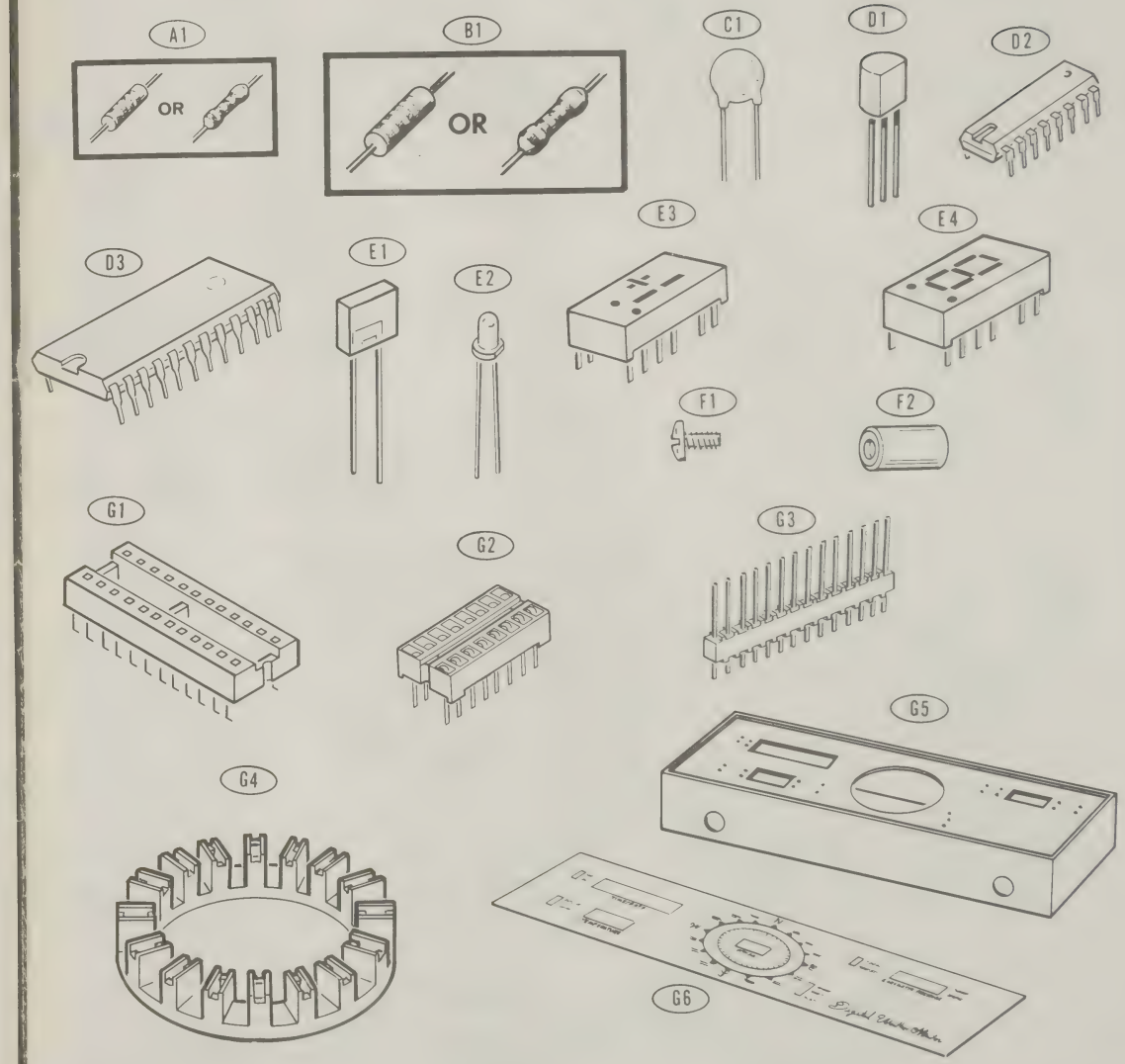
ILLUSTRATION BOOKLET

Part of 595-1999-06

PARTS PICTORIAL #1



PARTS PICTORIAL #2



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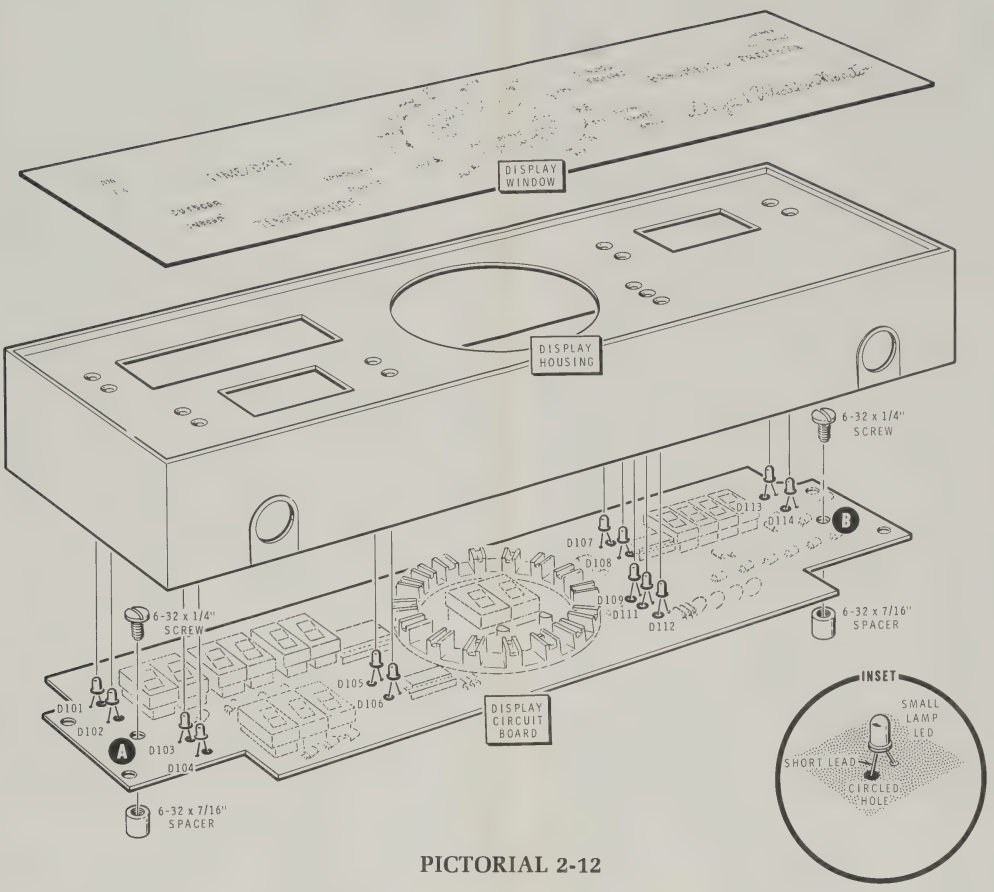
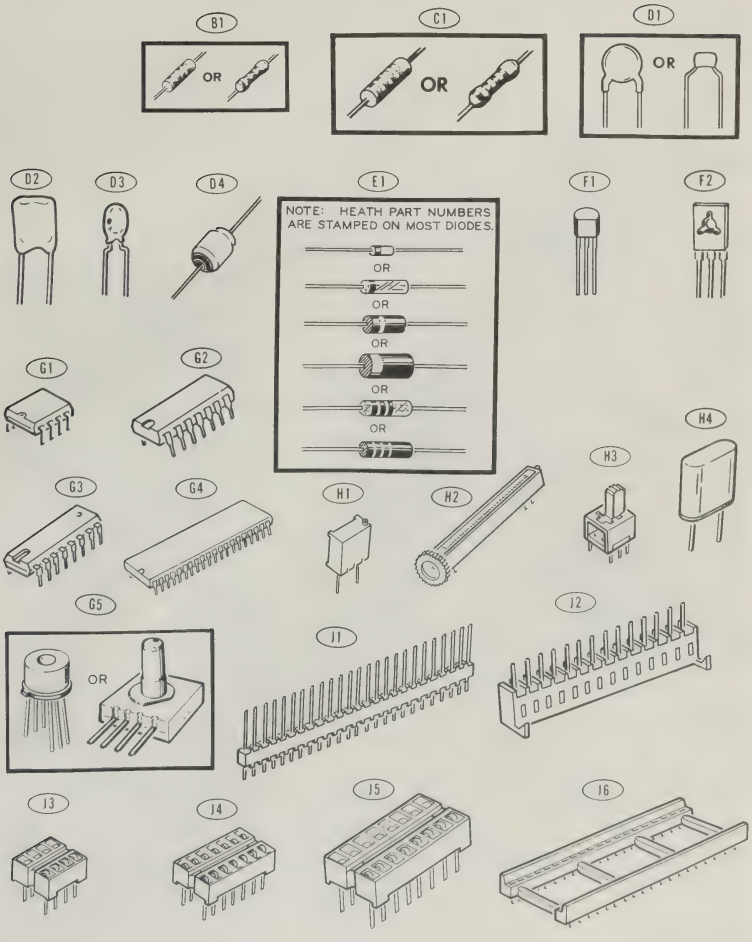
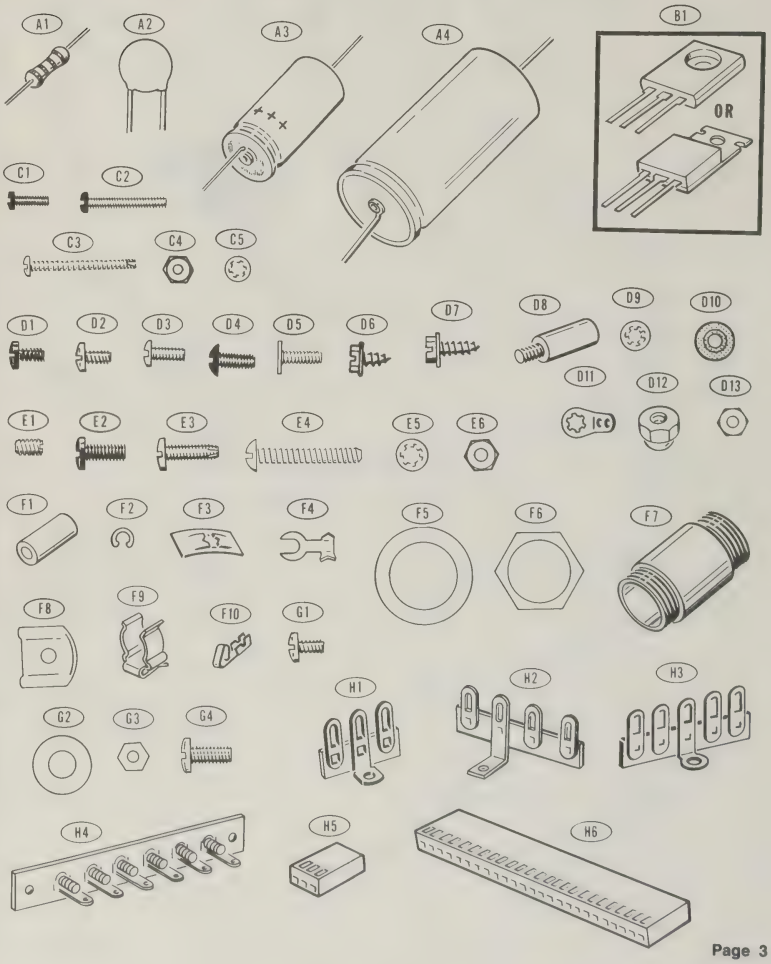


PICTORIAL 2-12

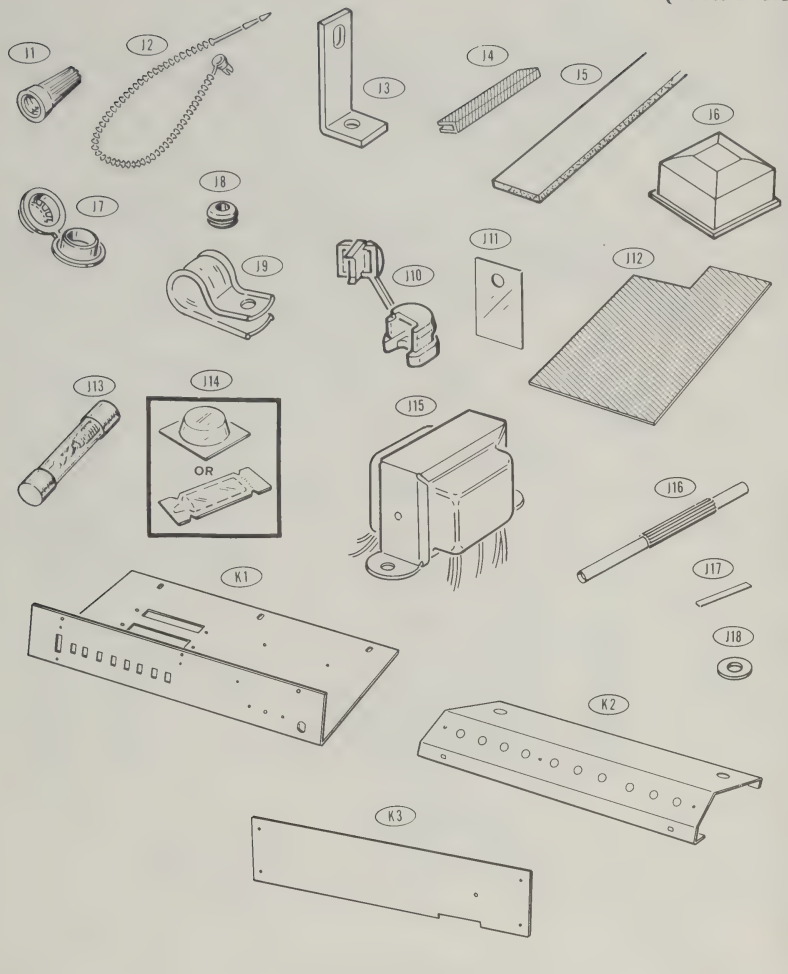
PARTS PICTORIAL #3

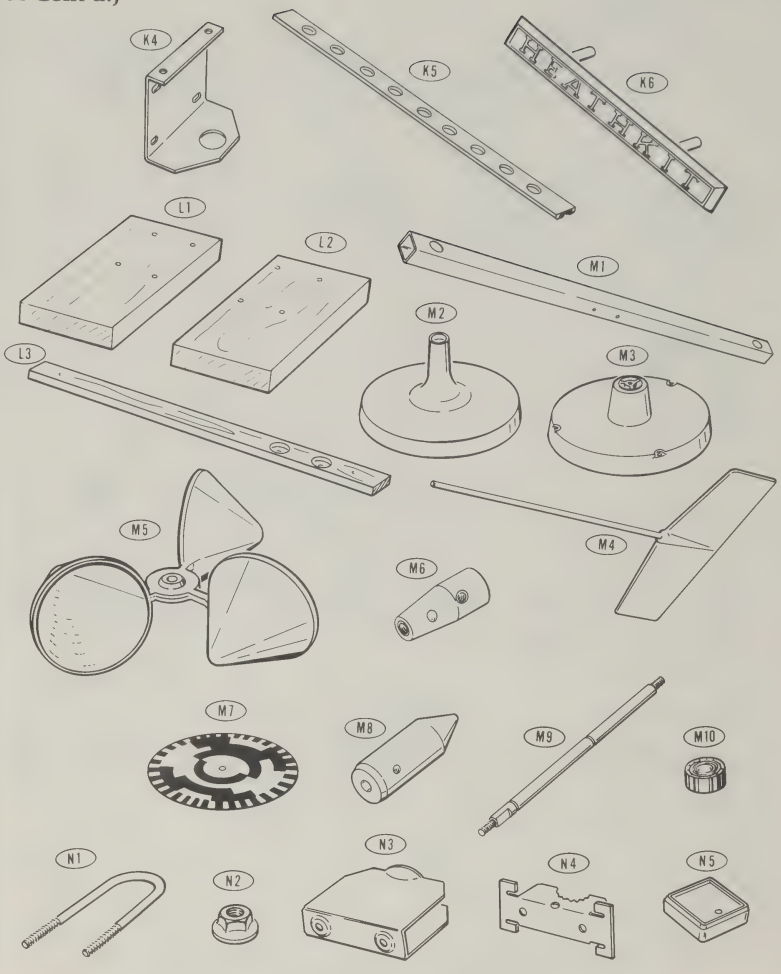


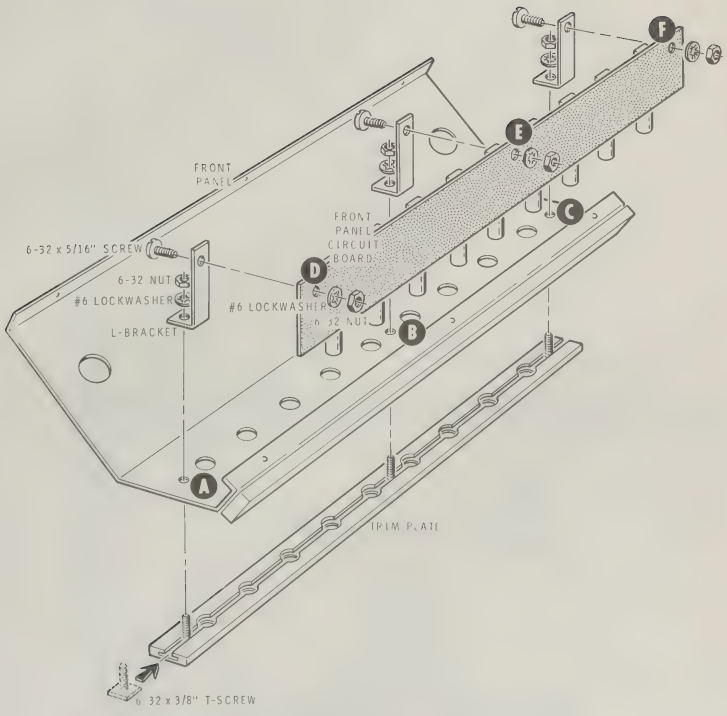
FRONT PANEL/CHASSIS PARTS PICTORIAL



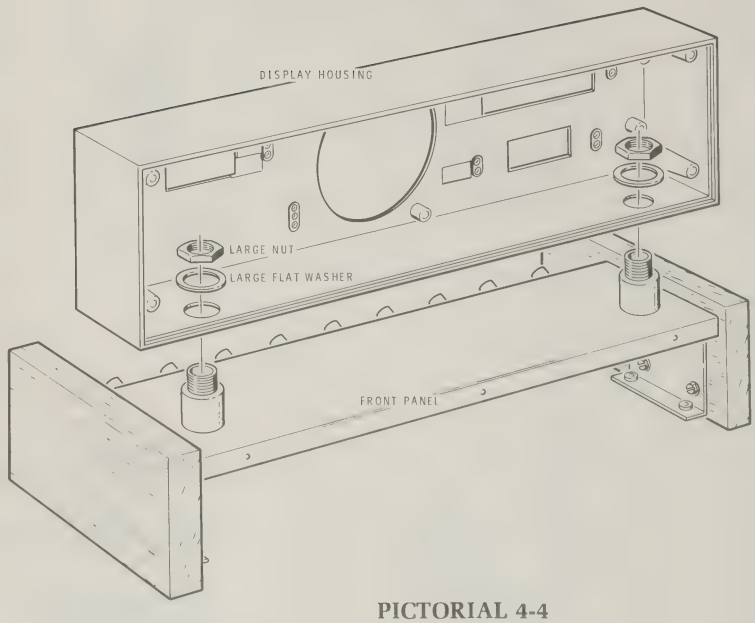
(Parts Pictorial Cont'd.)



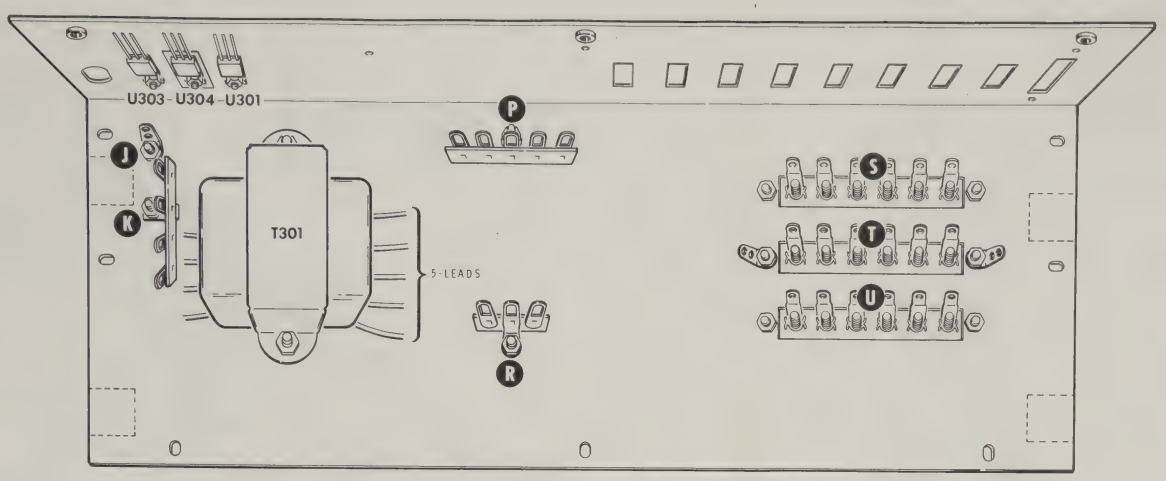




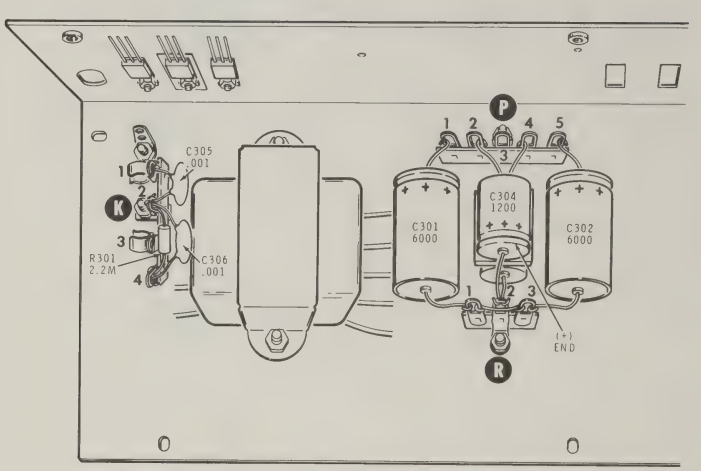
PICTORIAL 4-2



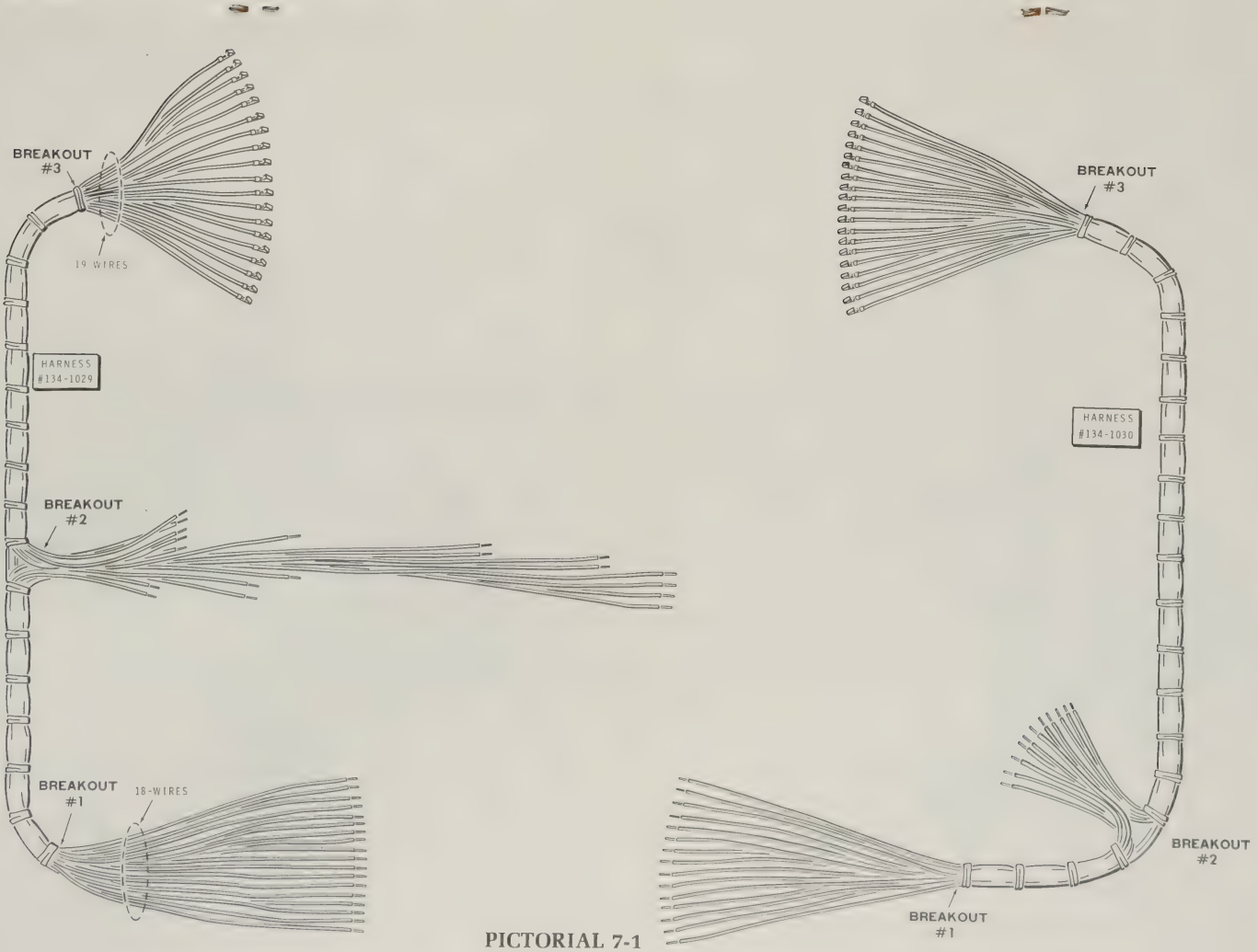
PICTORIAL 4-4



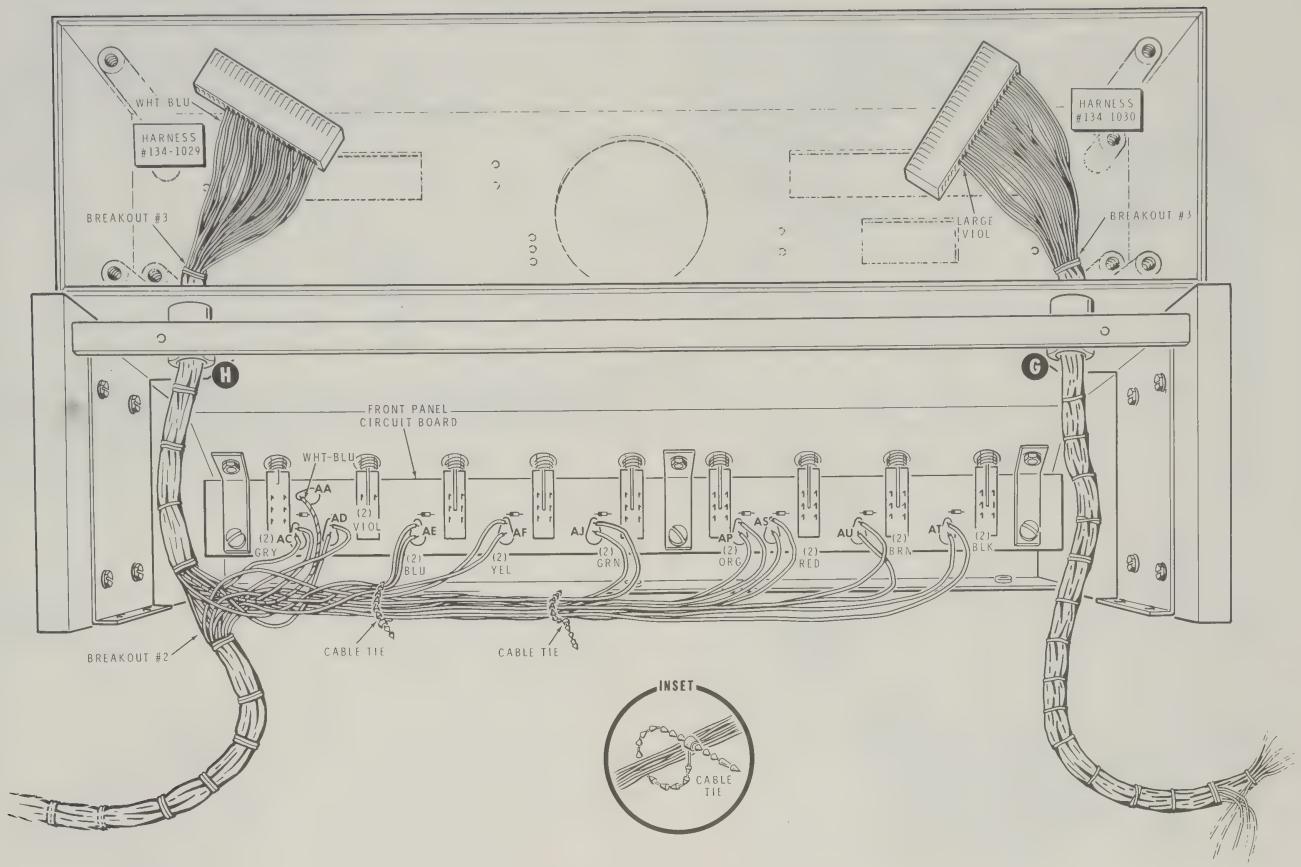
PICTORIAL 5-1



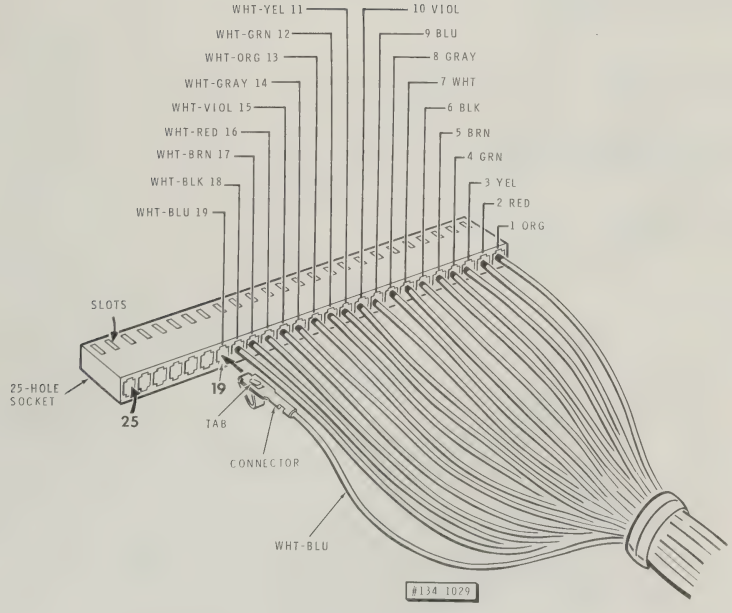
PICTORIAL 6-1



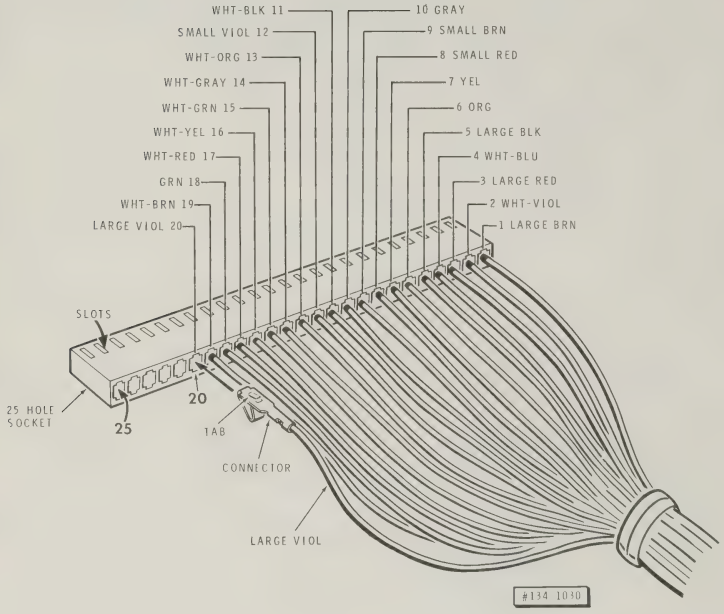
PICTORIAL 7-1



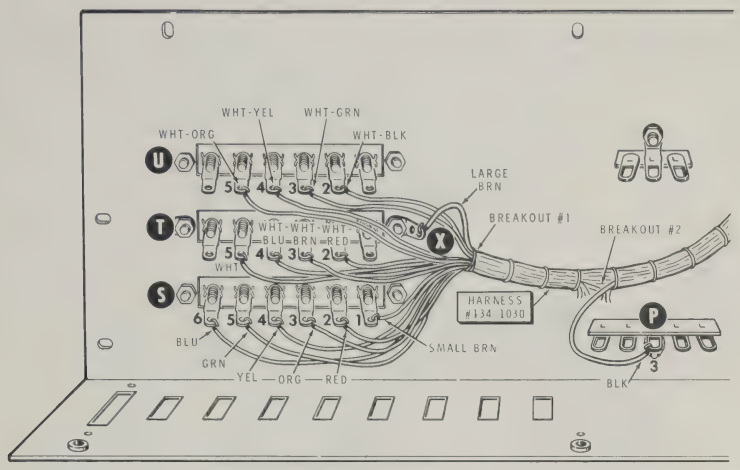
PICTORIAL 7-2



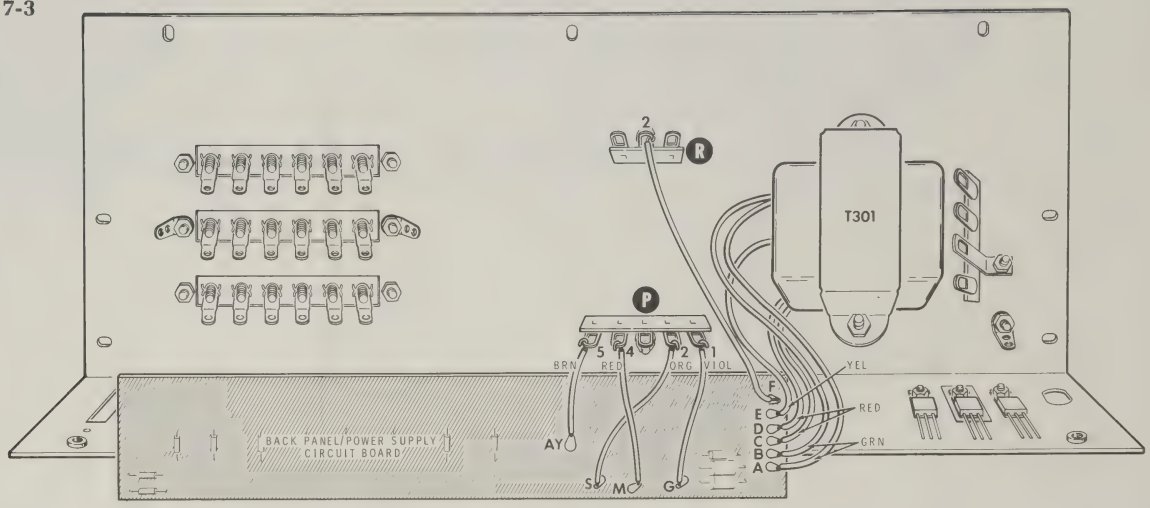
Detail 7-2A



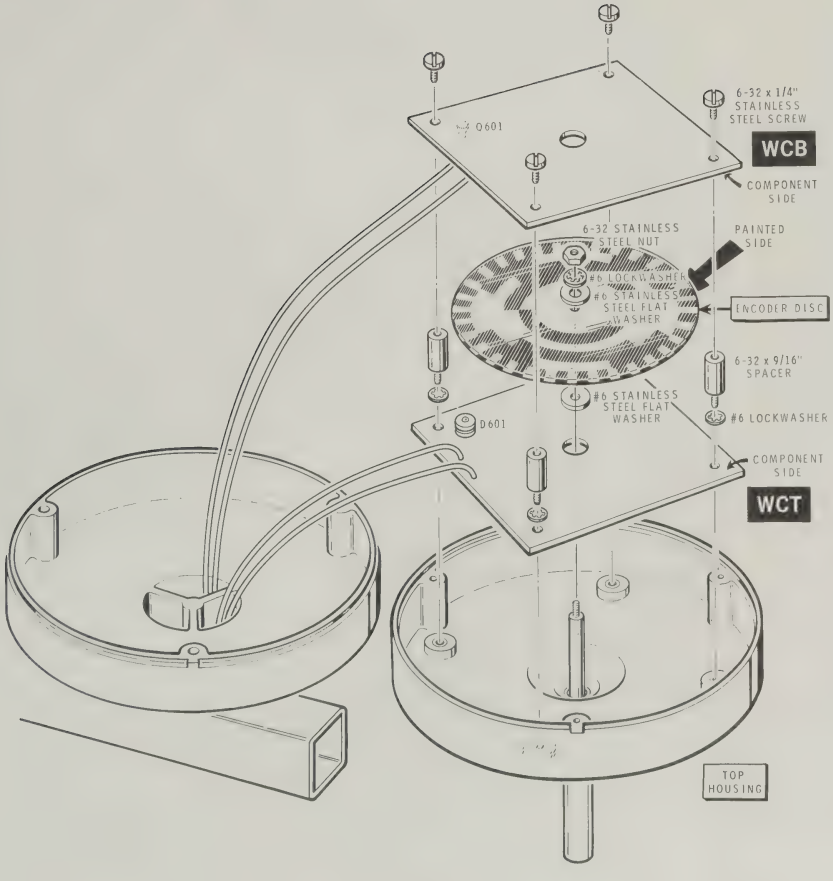
Detail 7-2B



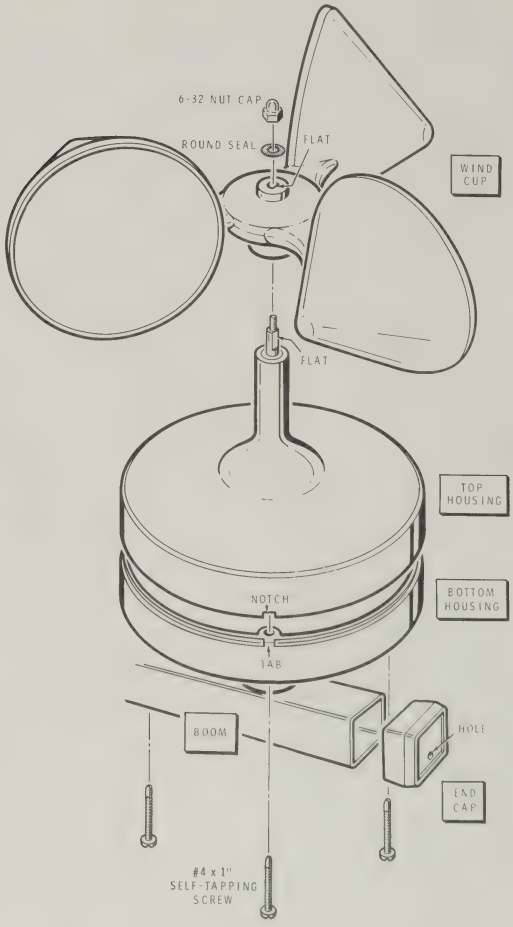
PICTORIAL 7-3



PICTORIAL 7-4



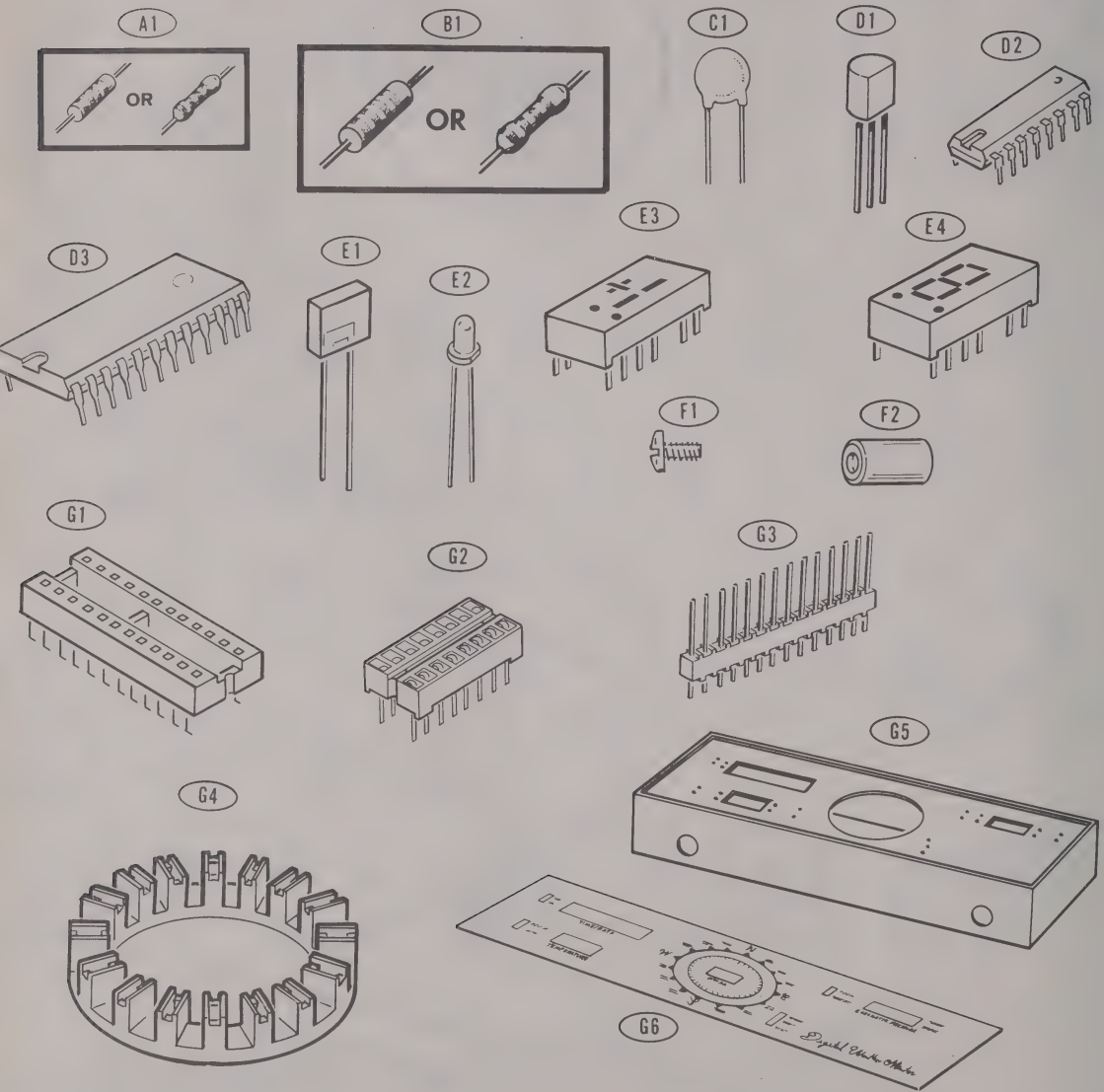
PICTORIAL 9-6



PICTORIAL 9-7

Part of 595-1999-06

PARTS PICTORIAL #2



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( ) Refer to Detail 7-7A and prepare the 8-wire flat cable.

Refer to Pictorial 7-7 for the following steps.

( ) Install a connector on one end of each group of cables and on both ends of the brown wire. See inset drawing #1.

In the following steps, you will insert the connectors that are on these cables into the 3-hole sockets. Be sure to position the sockets with the slotted side up and the connectors with the small tab up when you insert them. See inset drawing #2.

BLUE-GREEN CABLE (PLUG AL)

( ) Blue in hole 1.

( ) Green in hole 3.

( ) Set it aside.

ORANGE-RED CABLE (PLUG AK)

( ) Red to hole 2.

( ) Orange to hole 3.

( ) Set it aside.

GRAY-VIOLET CABLE (PLUG AJ)

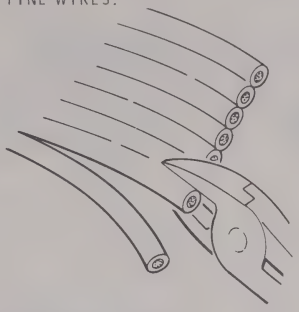
( ) Violet to hole 1.

( ) Gray to hole 3.

BROWN WIRE

( ) Insert one end in hole 2 of AJ and the other end in hole 1 of AK.

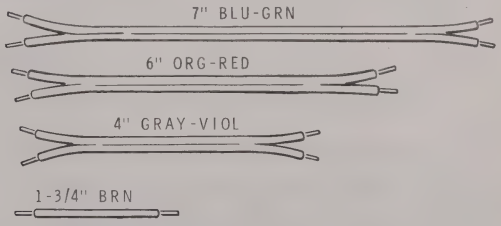
A SEPARATE THE LEADS AT THE END APPROXIMATELY 1/4" USING A PAIR OF CUTTERS. TO DO THIS, FIRST LET THE SHARP EDGES OF THE CUTTER SEAT IN THE GROOVE BETWEEN THE LEADS AND THEN CUT THEM APART JUST AT THE END. BE CAREFUL NOT TO CUT THE INSULATION AND EXPOSE THE FINE WIRES.



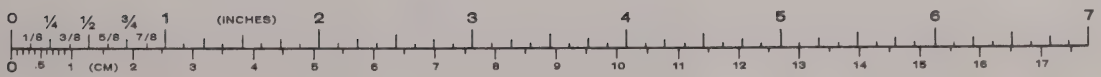
B 2-WIRE COLOR COMBINATIONS WILL BE MADE FROM THIS FLAT CABLE. TO DO THIS, PULL THE TWO LEADS FROM THE CABLE AS A GROUP. PULL THE FOLLOWING COMBINATION GROUPS FROM THE CABLE.

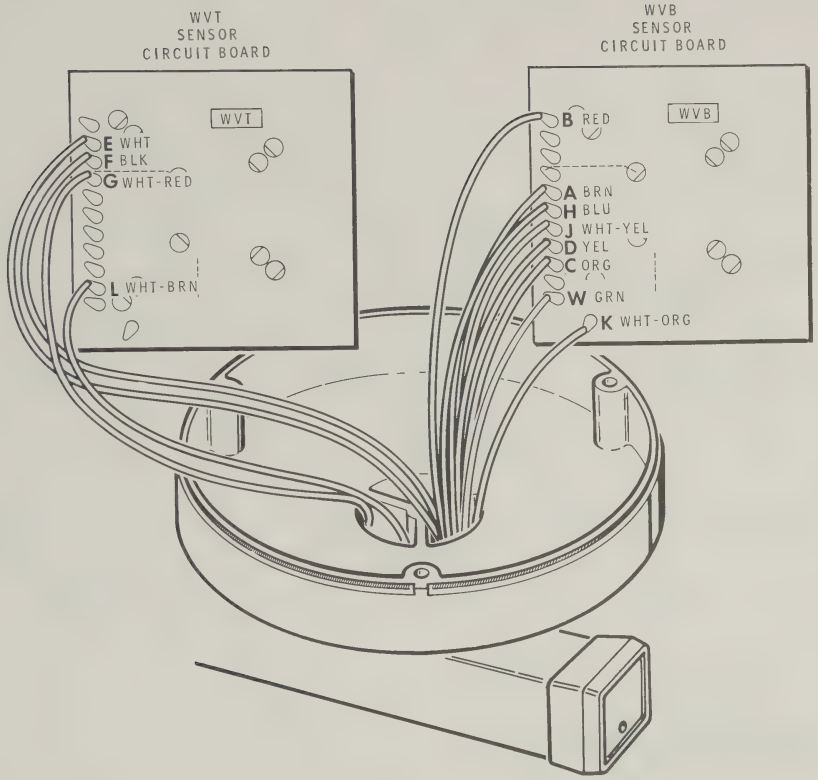
GRAY-VIOLET
GREEN-BLUE
ORANGE-RED
YOU MAY DISCARD THE YELLOW WIRE, BUT SAVE THE BROWN.

C CUT THE GROUPS OF WIRES TO THE FOLLOWING LENGTHS. PULL THE WIRES APART FOR 3/4" AT EACH END. THEN PREPARE THE ENDS AS YOU DID THE OTHER STRANDED WIRE. ALSO, PREPARE THE LENGTH OF BROWN WIRE.

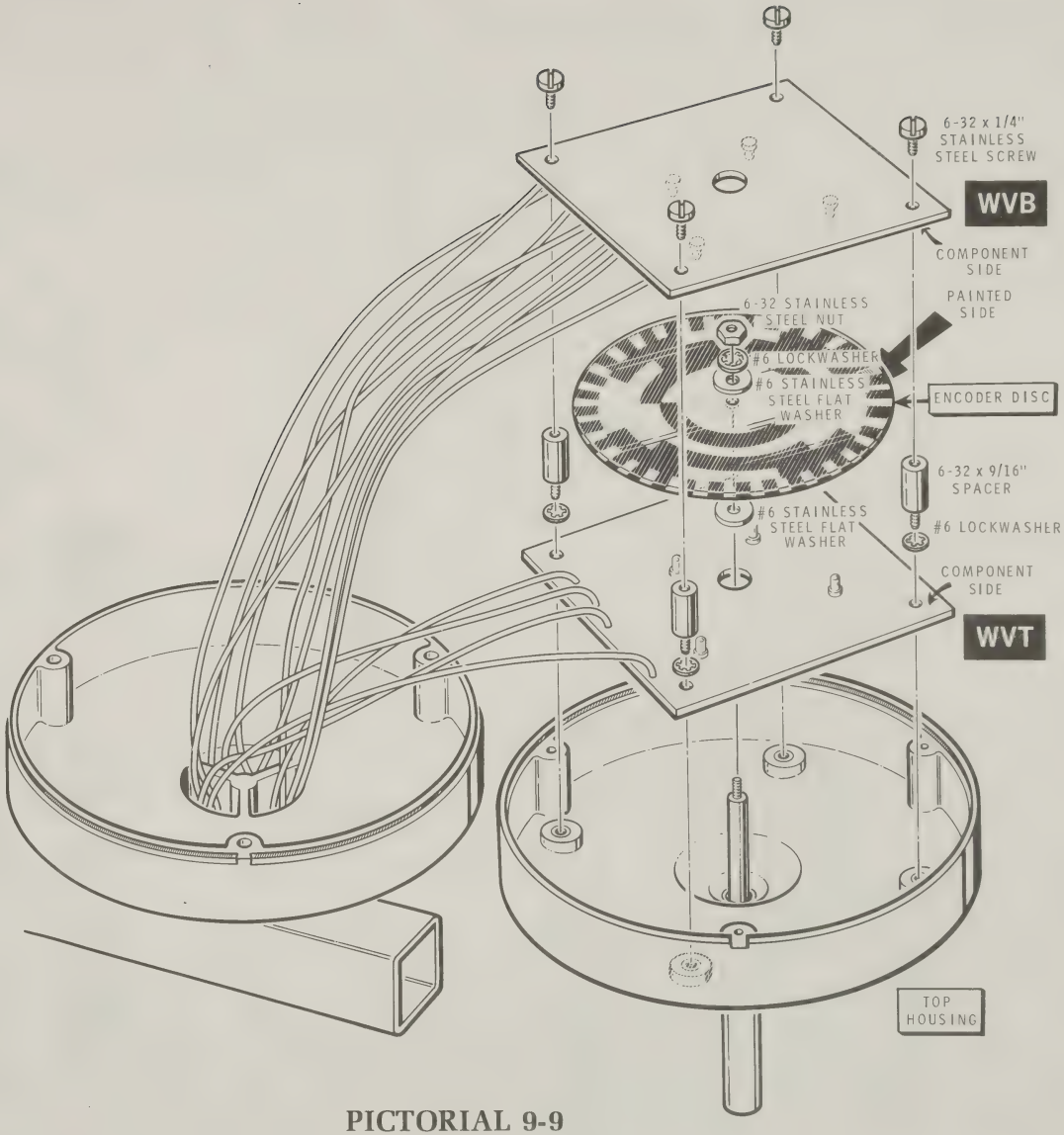


Detail 7-7A





PICTORIAL 9-8

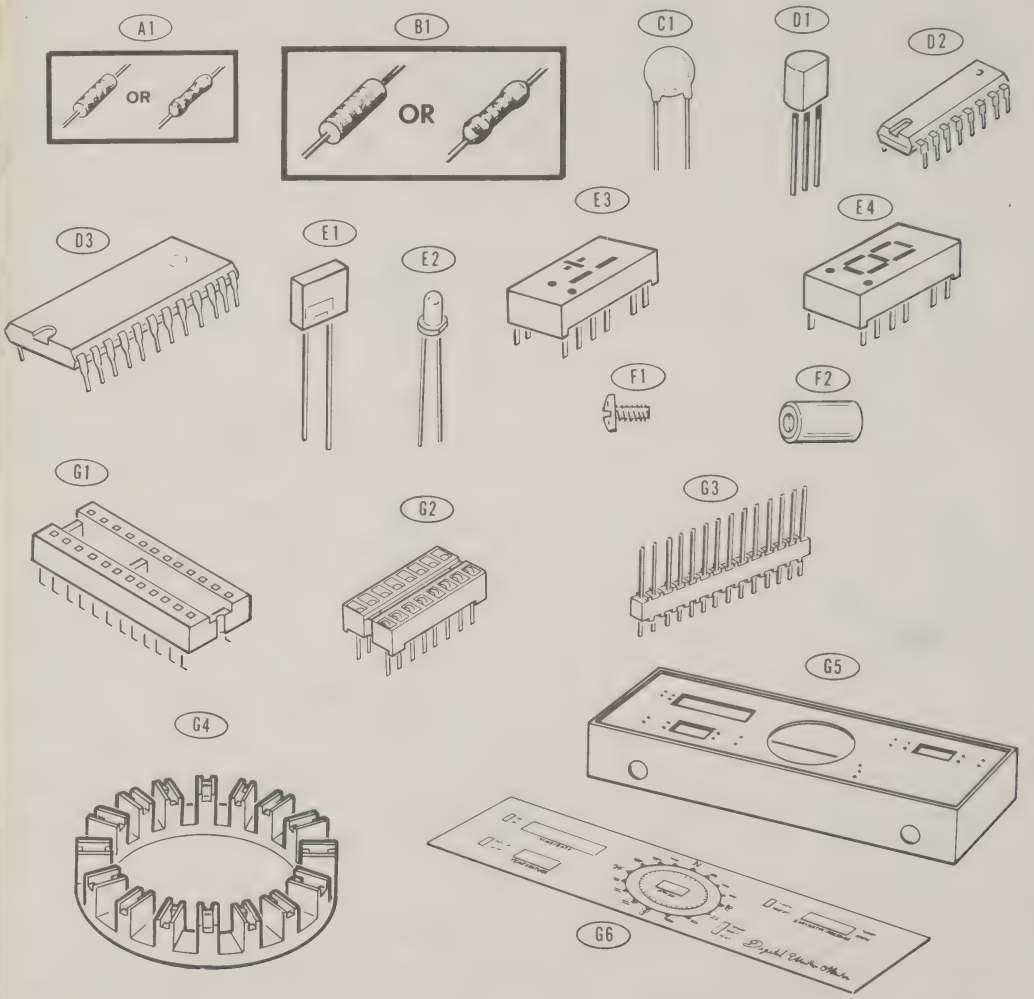


PICTORIAL 9-9

ON BOOKLET

Part of 595-1999-06

PARTS PICTORIAL #2



Model ID-4001 Assembly

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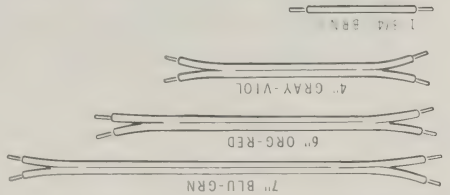
Detail 7-7A



( ) Refer to Detail 7-7A and prepare the 8-wire flat cable.

Refer to Pictorial 7-7 for the following steps.

( ) Install a connector on one end of each group of cables and on both ends of the brown wire. See inset drawing #1.

In the following steps, you will insert the connectors that are on these cables into the 3-hole sockets. Be sure to position the sockets with the slotted side up and the connectors with the small tab up when you insert them. See inset drawing #2.

BLUE-GREEN CABLE (PLUG AL)

( ) Blue in hole 1.

( ) Green in hole 3.

( ) Set it aside.

ORANGE-RED CABLE (PLUG AK)

( ) Red to hole 2.

( ) Orange to hole 3.

( ) Set it aside.

GRAY-VIOLET CABLE (PLUG AJ)

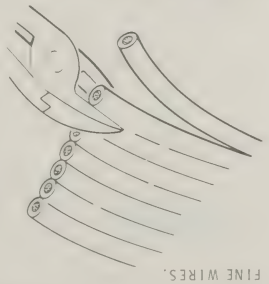
( ) Violet to hole 1.

( ) Gray to hole 3.

BROWN WIRE

( ) Insert one end in hole 2 of AJ and the other end in hole 1 of AK.

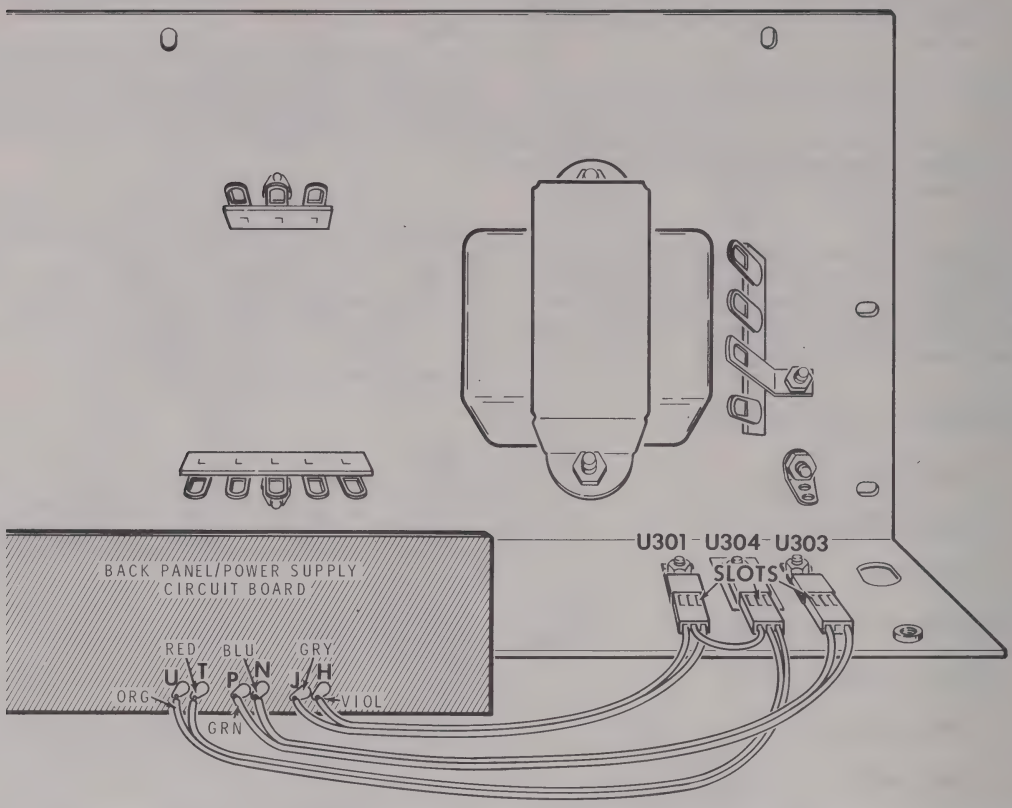
A SEPARATE THE LEADS AT THE END APPROXIMATELY 1/4" USING A PAIR OF CUTTERS. TO DO THIS, FIRST LET THE SHARP EDGES OF THE CUTTER SEAT IN THE GROOVE BETWEEN THE LEADS AND THEN CUT THEM APART JUST AT THE END. BE CAREFUL NOT TO CUT THE INSULATION AND EXPOSE THE FINE WIRES.



B 2-WIRE COLOR COMBINATIONS WILL BE MADE FROM THIS FLAT CABLE. TO DO THIS, PULL THE TWO LEADS FROM THE CABLE AS A GROUP. PULL THE FOLLOWING COMBINATION GROUPS FROM THE CABLE.

GRAY-VIOLET
GREEN-BLUE
ORANGE-RED
YOU MAY DISCARD THE YELLOW WIRE. BUT SAVE THE BROWN.

C CUT THE GROUPS OF WIRES TO THE FOLLOWING LENGTHS. PULL THE WIRES APART FOR 3/4" AT EACH END. THEN PREPARE THE ENDS AS YOU DID THE OTHER STRANDED WIRE. ALSO, PREPARE THE LENGTH OF BROWN WIRE.



PICTORIAL 7-8

Refer to Pictorial 7-8 for the following steps.

When you install the sockets on the IC's in the following steps, make sure the slotted side of the sockets are out as shown. Then insert the sockets on the IC lugs.

( ) Plug the socket with the blue-green cable onto U303.

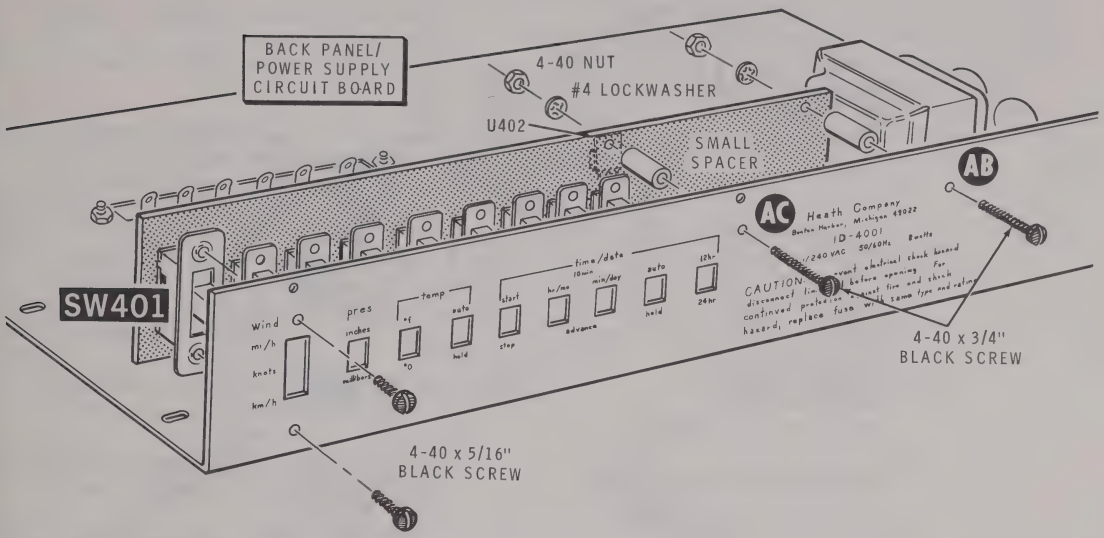
( ) Plug the socket with the orange-red cable onto U304 and the other socket onto U301.

Connect the free end of the cables to the back panel/power supply circuit board in the following steps. Solder the wires to the foil on the back side and cut off the excess lengths.

( ) Violet wire to hole H; gray wire to hole J.

( ) Blue wire to hole N; green wire to hole P.

( ) Red wire to hole T; orange wire to hole U.



PICTORIAL 7-9

Now carefully inspect the circuit board at the locations that you connected all of the wires for the following conditions:

( ) Unsoldered connections.

( ) Poor solder connections.

( ) Solder bridges between foil patterns.

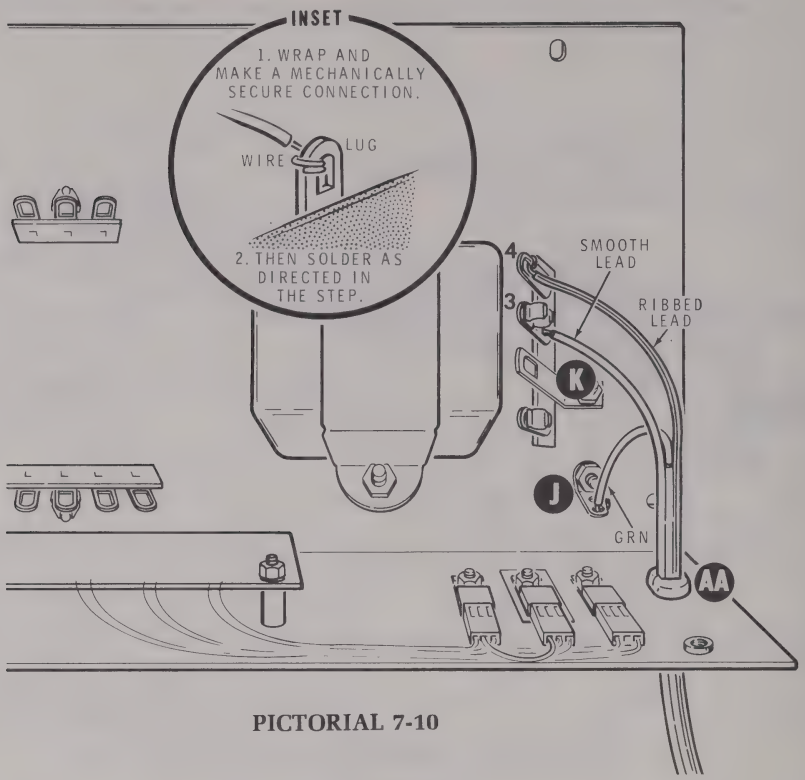
( ) Protruding leads which could touch together.

Refer to Pictorial 7-9 for the following steps.

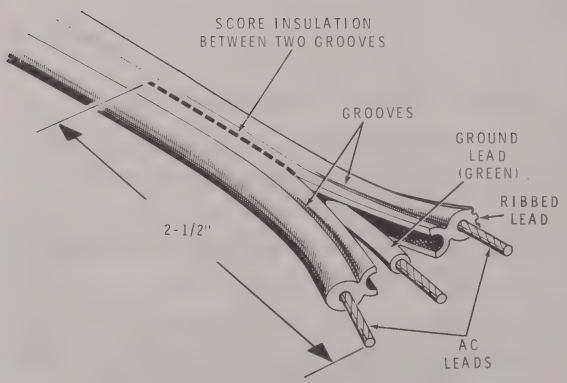
( ) Place the circuit board against the back of the chassis so the switches come through their respective locations.

( ) Fasten the board at switch SW401 with 4-40 × 5/16" black screws.

( ) Fasten the board and regulator IC U402 at AB and AC with 4-40 × 3/4" black screws, small spacers, #4 lockwashers, and 4-40 nuts.



PICTORIAL 7-10



Detail 7-10A

LINE CORD PREPARATION

Refer to Pictorial 7-10 for the following steps.

( ) Refer to Detail 7-10A and split the outer insulation of the line cord in the following manner, as shown, so you do not cut into the protective insulation for the AC lead.

1. Use a knife point to score a line, as shown, BETWEEN the two grooves.
2. Turn the cord over and repeat step 1.
3. Grasp the lead ends by the insulation and pull the leads apart. The line cord will separate on the scored lines.
4. Twist the end of each lead and apply a small amount of solder.

NOTE: When you connect a lead in the following steps, be sure you make a mechanically secure connection before soldering. See the inset drawing.

( ) Route the line cord through hole AA.

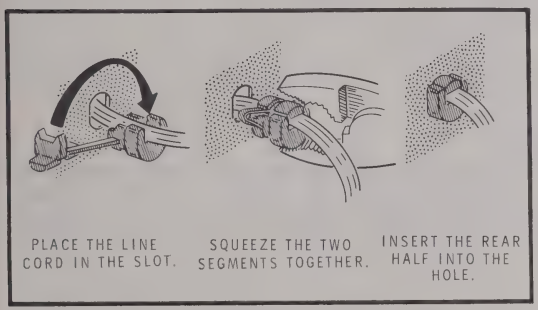
( ) Connect the green lead to solder lug J (S-1).

( ) Connect the ribbed lead to lug 4 of terminal strip K (S-3). The soldering instructions do not include the two leads in the bottom hole of the lug.

( ) Smooth lead to the bottom hole in lug 3 of terminal strip K (S-1). Make a slight loop at the end of this lead to insure a mechanically secure connection.

( ) Route the line cord leads against the terminal strip and away from the edge of the chassis.

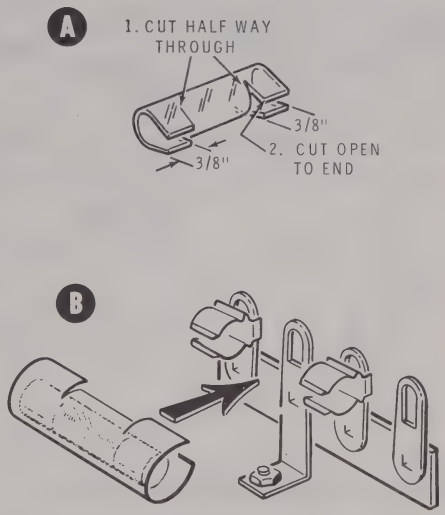
( ) Refer to Detail 7-10B and secure the line cord in hole AA with the line cord strain relief.



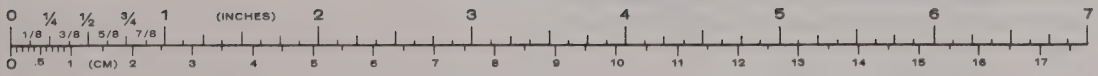
Detail 7-10B

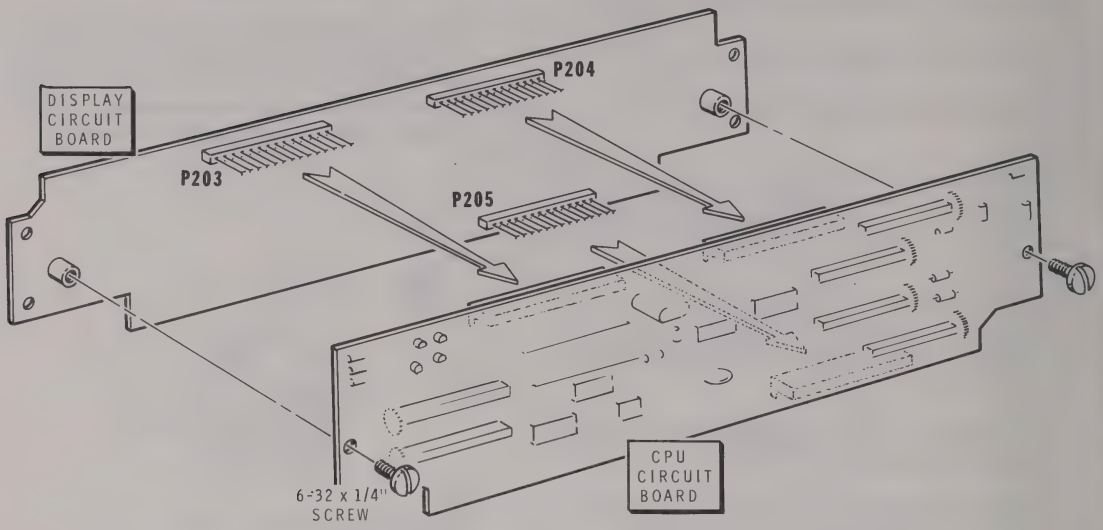
( ) Refer to Part A of Detail 7-10C and prepare the 1-1/2" length of clear tubing.

( ) Install the 3/16-ampere fuse. Insert the fuse into the tubing as shown in Part B of Detail 7-10C and install it in the two clips on terminal strip K. Be sure to support the terminal strip. NOTE: The same fuse is used for 240 V operation.



Detail 7-10C





PICTORIAL 8-1

Refer to Pictorial 8-1 for the following steps.

( ) Position the display and CPU circuit boards as shown. Then insert plugs P203, P204, and P205 onto the sockets on the CPU board.

( ) Install 6-32 × 1/4″ screws in spacers A and B.

Refer to Pictorial 8-2 for the following steps.

( ) Place the front panel over the chassis so the lip is on the outside of the chassis. Make sure none of the wires (including the line cord leads) get pinched between the chassis and front panel. Then, install only two 6-32 × 1/4″ black screws to hold these assemblies together.

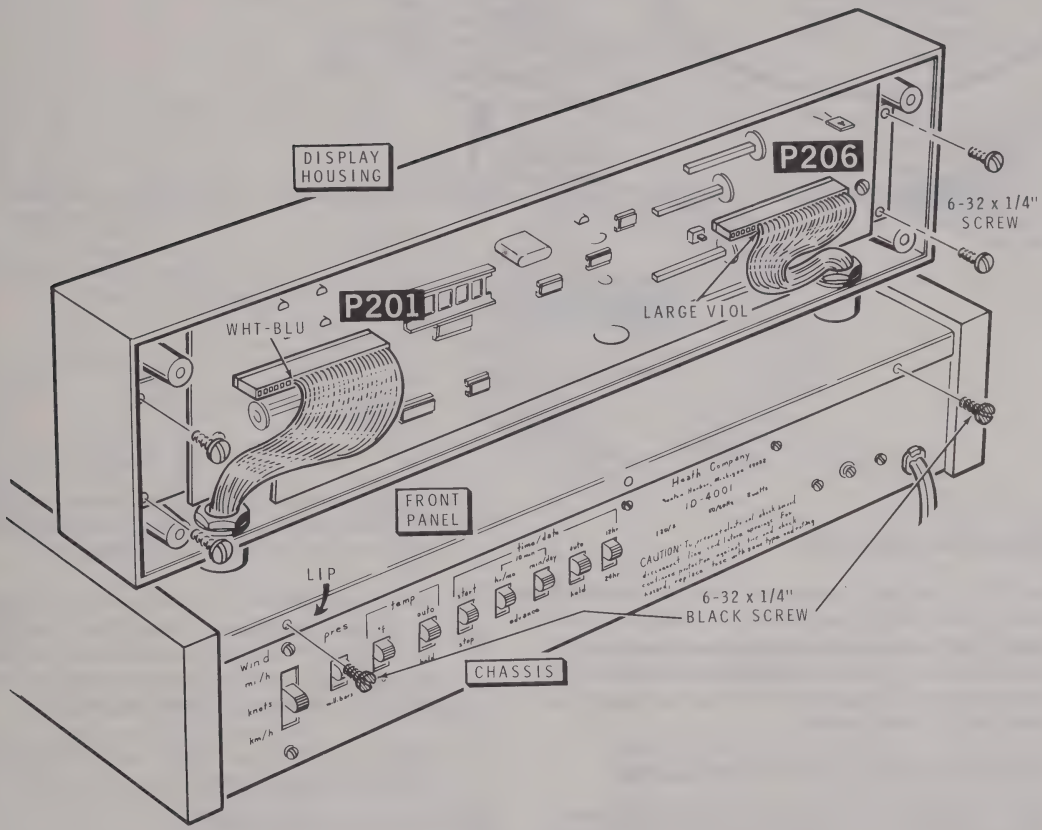
NOTE: Before you perform the following step, make sure the small LED's on the display circuit board are straight so they will fit through the holes in the front panel.

( ) Place the display and CPU circuit boards into the housing so the holes on the right and left sides of the display board are lined up with the holes in the housing. Then install four 6-32 × 1/4″ screws.

( ) Position socket S201 with the white-blue wire on the left side and insert the socket on plug P201.

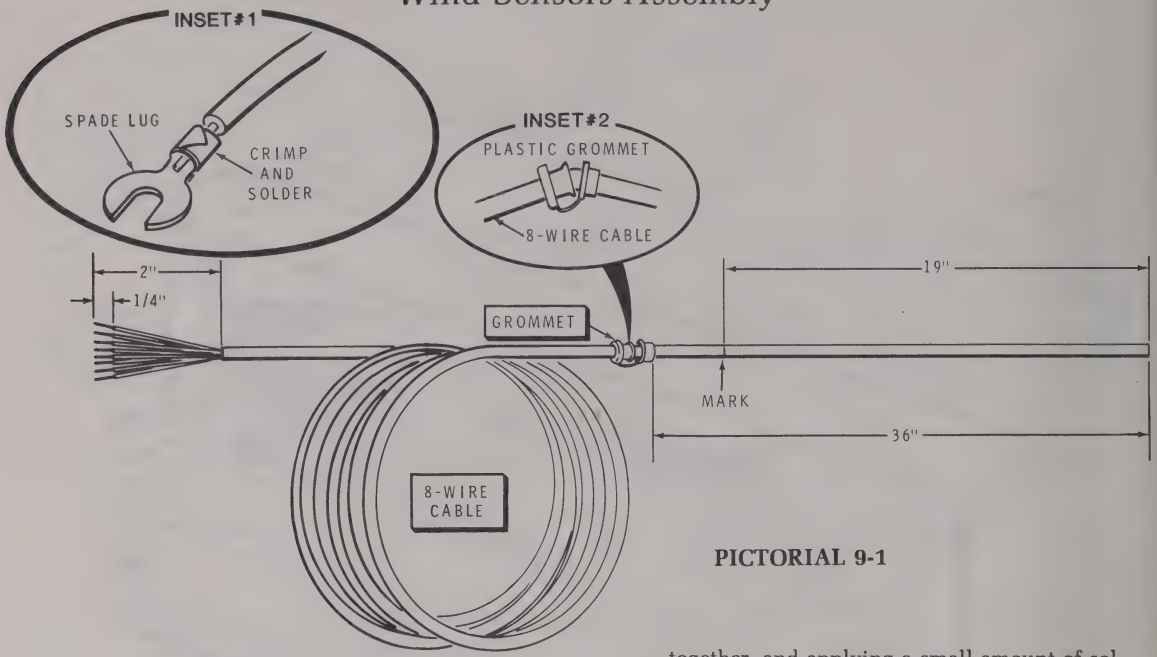
( ) Position socket S206 with the large violet wire on the left side and insert the socket on plug P206.

This completes the main assembly of the Digital Weather Computer. Now proceed with the assembly of the wind sensors. NOTE: The integrated circuits will not be installed on the CPU circuit board until after the "Initial Tests" have been completed.



PICTORIAL 8-2

Wind Sensors Assembly



PICTORIAL 9-1

CABLE PREPARATION

NOTE: Locate the 8-wire cable that you purchased. Then, before you prepare the ends of the cable, turn to Page 13 of the Operation Manual and read the information under "Wind Sensor Assembly." After you determine how long the cable should be, proceed with the following steps.

Refer to Pictorial 9-1 for the following steps.

CAUTION: When you remove the outer insulation in the following step, be very careful that you do not nick or scrape the insulation on the colored wires inside the 8-wire cable. One way to cut the insulation is with a pair of pointed scissors. Insert the scissors a small amount, clip the insulation, and repeat.

( ) Remove 2" of outer insulation from one end of the cable.

( ) Prepare the ends of each wire by removing 1/4" of insulation, twisting the fine strands of wire together, and applying a small amount of solder. Then install a spade lug on the end of each wire as shown in inset drawing #1.

( ) Refer to inset drawing #2 and position the plastic grommet as shown. Then insert the other end of the 8-wire cable through both halves of the grommet. Slide the grommet about 36" onto the cable and leave it there temporarily.

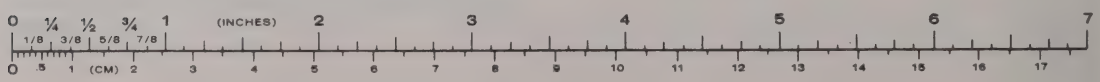
( ) Using a marker pen make a mark around the cable 19" from the end.

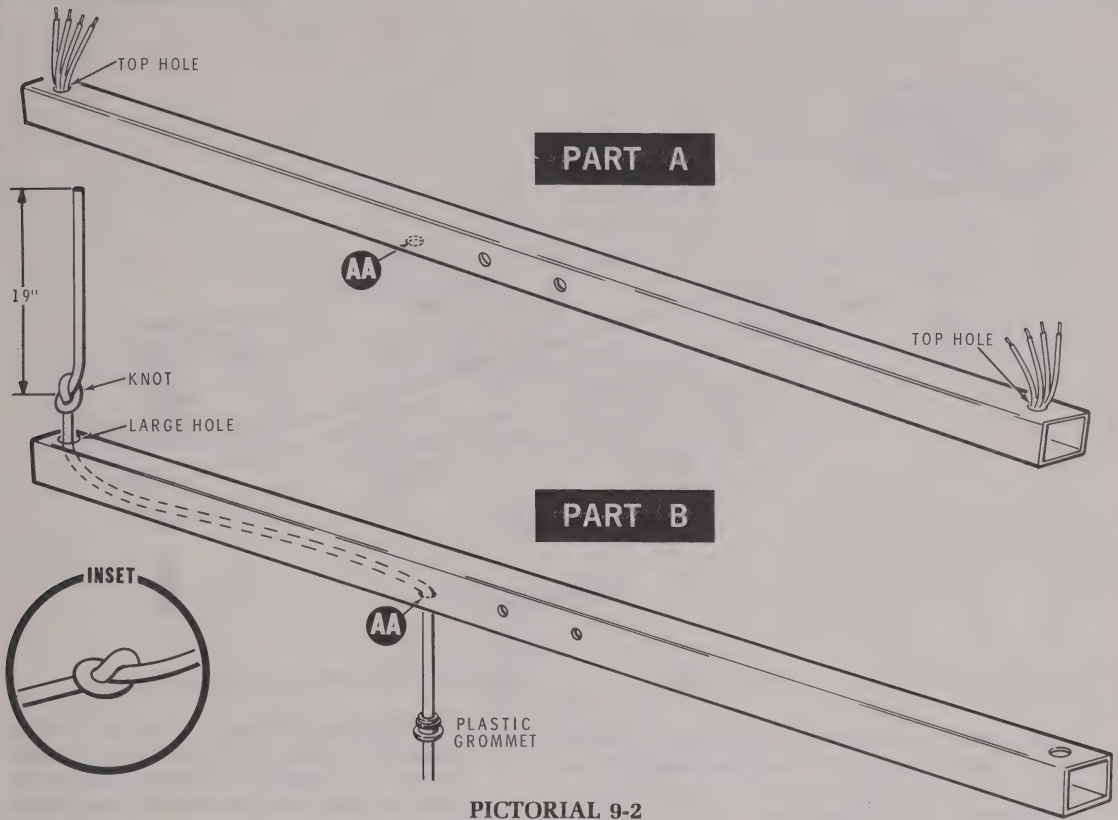
Set the cable aside temporarily.

BOOM PARTS MOUNTING

( ) Cut the following lengths of wire and prepare the ends as you did in the previous step.

38" white-orange
38" white-yellow
38" white-brown
38" white-red





PICTORIAL 9-2

Refer to Part A of Pictorial 9-2 for the following steps.

( ) Position the boom so the two top holes near each end are up, and hole AA that is closer to one end is toward the left.

( ) Tape one end of the four wires you just prepared. Route this end through one top hole and through the boom to the other top hole. Center the wires so the same amount protrudes at each end. Then remove the tape.

Refer to Part B of Pictorial 9-2 for the following steps.

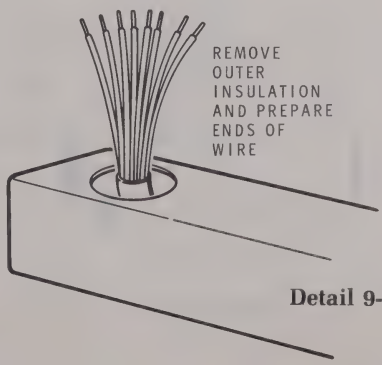
( ) Route the unprepared end of the 8-wire cable through hole AA and the indicated top hole in the boom. Pull the cable through to the 19" mark.

( ) Tie a knot at the mark and pull it tight so it can fit through the top hole.

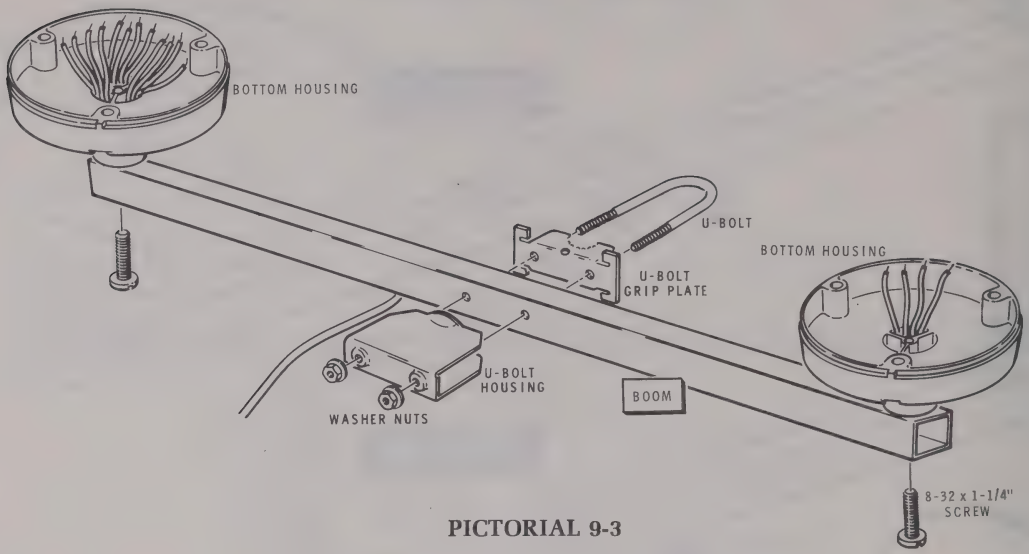
( ) Pull the cable back through hole AA to the knot.

( ) Slide the plastic grommet along the cable and insert the first part into hole AA. Then insert the second part of the grommet into the first part.

( ) Refer to Detail 9-2A and remove all of the outer insulation from the length of cable that protrudes from the top hole. Then prepare the ends of each wire, but do not form a hook at the ends.



Detail 9-2A

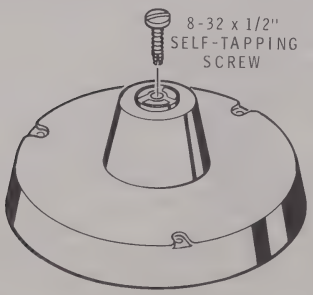


PICTORIAL 9-3

Refer to Pictorial 9-3 for the following steps.

NOTE: Before you install the U-bolt assembly on the boom in the following step, determine which side is more practical for when you mount the boom to your TV tower or other location later.

( ) Mount the U-bolt, U-bolt grip plate, and U-bolt housing to the boom with the two washer nuts. Do not tighten the nuts all the way. NOTE: When you insert the U-bolt through the boom be careful that none of the wires get in the way.



Detail 9-3A

Refer to Pictorial 9-3 for the following steps.

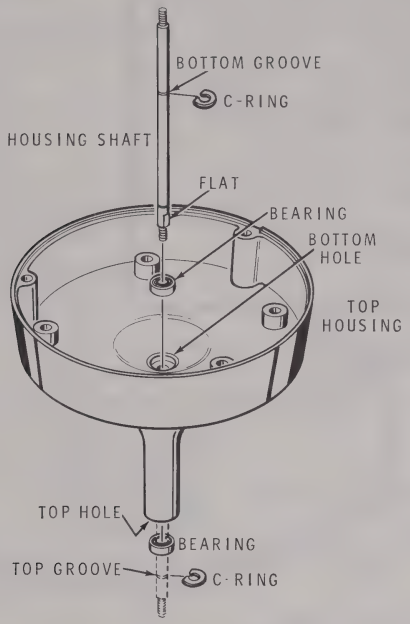
( ) Refer to Detail 9-3A and position both bottom housings as shown. Then prethread the center hole with an 8-32 × 1/2" self-tapping screw. Turn the screw in all the way and then remove it.

NOTE: If you have facilities, fasten the boom to a vertical pipe or similar object at your work area. This will make it easier to work with the boom assembly in the next steps.

NOTE: When you route the wires through the bottom housings in the following steps, use the slotted holes.

( ) Route the twelve wires at one end of the boom through one of the bottom housings. Then, mount the housing on the boom with an 8-32 × 1-1/4" screw. Make sure the housing seats properly in the boom.

( ) Similarly mount the other bottom housing on the other end of the boom with an 8-32 × 1-1/4" screw.



PICTORIAL 9-4

TOP HOUSING ASSEMBLY

Refer to Pictorial 9-4 for the following steps.

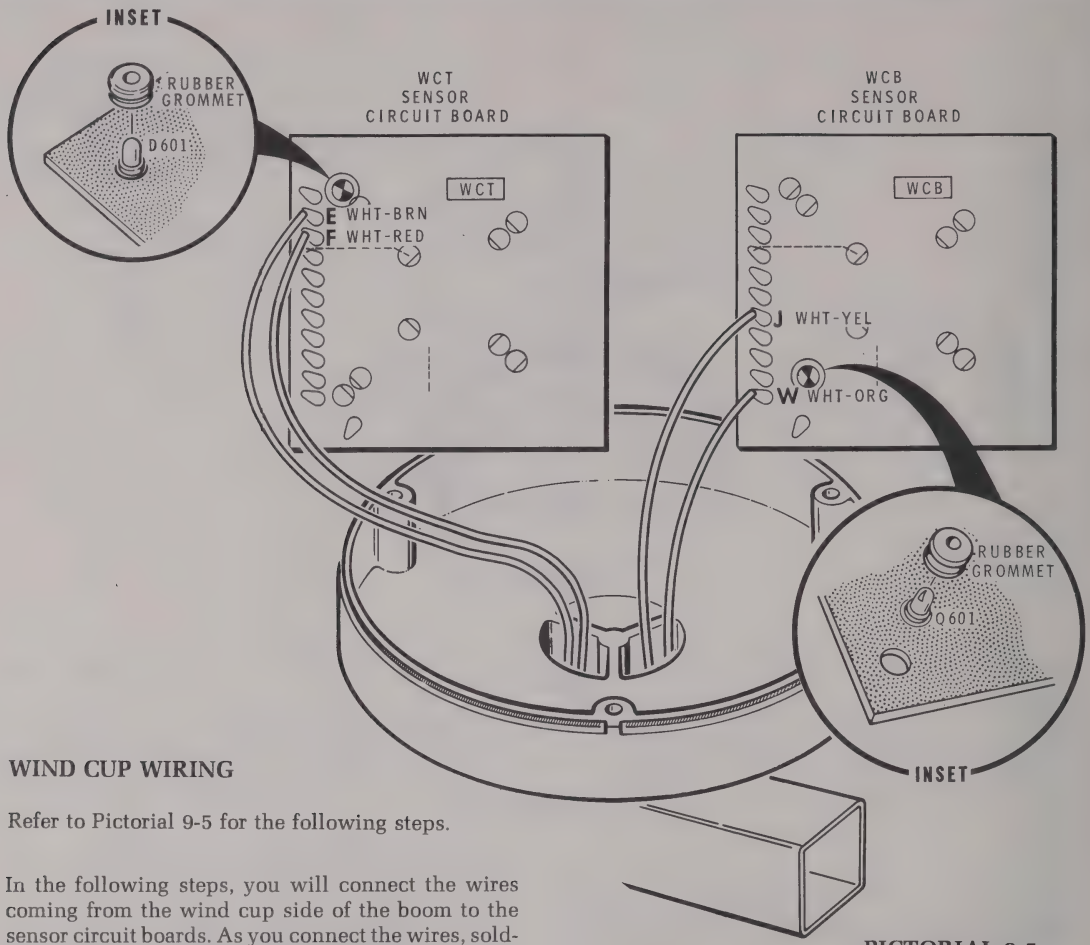
Perform the following steps twice, once for each top housing. Two sets of step marks are supplied for this purpose.

( ) ( ) Position the top housing as shown and place a bearing in the bottom hole.

( ) ( ) Position the housing shaft so the flat is as shown. Then, insert a C-ring around the bottom groove in the shaft and push the shaft through the bearing.

( ) ( ) Hold the shaft in place and turn the housing over. Slide another bearing over the shaft and into the top hole. Install a C-ring in the top groove around the shaft.

Set the housings aside temporarily.



PICTORIAL 9-5

WIND CUP WIRING

Refer to Pictorial 9-5 for the following steps.

In the following steps, you will connect the wires coming from the wind cup side of the boom to the sensor circuit boards. As you connect the wires, solder them to the foil and cut off the excess lengths.

NOTE: In the following steps, use the side of the boom with only the four wires coming from the housing.

( ) Locate the two sensor circuit boards that are marked WCT and WCB.

WCT Circuit Board

Position the WCT board as shown and connect the wires in the following steps.

( ) White-brown to hole E.

( ) White-red to hole F.

( ) Refer to the inset drawing and press a rubber grommet over Q601 on the WCB circuit board.

( ) Similarly, install a rubber grommet over D601 on the WCT circuit board.

WCB Circuit Board

Position the WCB board as shown and connect the wires in the following steps.

( ) White-yellow to hole J.

( ) White-orange to hole W.

Refer to Pictorial 9-6 (Illustration Booklet, Page 11) for the following steps.

In the following steps, you will mount these two circuit boards in one of the top housings.

Locate the envelope of stainless steel hardware. These will be used along with other hardware.

( ) Place one of the top housings upside down next to the bottom housing.

( ) Place the WCT board in the housing component side up. Then fasten the board with four 6-32 × 9/16" spacers and four #6 lockwashers.

( ) Place a #6 stainless steel flat washer over the shaft coming through the board.

( ) Peel the protecive backing from both sides of one of the encoder discs. Position the encoder disc with the painted side down and mount it on the shaft with a 6-32 stainless nut, a #6 lockwasher and a #6 stainless steel flat washer.

( ) Place the WCB circuit board component side down and with the wires coming out on the same side as the other board. Then, fasten the board with four 6-32 × 1/4" stainless steel screws.

Refer to Pictorial 9-7 (Illustration Booklet, Page 11) for the following steps.

( ) Check the wires coming from each board to make sure they are not touching the disc. Then turn the top housing right side up and place it on the bottom housing. Make sure none of the wires are pinched between the two housings. Now, rotate the top housing until the notch lines up with the tab on the bottom housing.

( ) Spin the shaft with your finger to check for any noise of wires rubbing on the disc. Then, fasten the housings together with three #4 × 1" self-tapping screws.

( ) Place the end cap with the hole pointing down and push it on the end of the boom.

( ) Position the wind cup as shown. Then, line up the flat in the cup with the flat on the shaft and install the cup. Fasten it with a round seal and a 6-32 cap nut.

WIND VANE WIRING

Refer to Pictorial 9-8 (Illustration Booklet, Page 12) for the following steps.

Locate the two sensor circuit boards that are marked WVT and WVB.

WVT Circuit Board

Position the WVT board as shown and connect the wires in the following steps.

( ) White to hole E.

( ) Black to hole F.

( ) White-red to hole G.

( ) White-brown to hole L.

WVB Circuit Board

Position the WVB board as shown and connect the wires in the following steps.

( ) Red to hole B.

( ) Brown to hole A.

( ) Blue to hole H.

( ) White-yellow to hole J.

( ) Yellow to hole D.

( ) Orange to hole C.

( ) Green to hole W.

( ) White-orange to hole K.

Refer to Pictorial 9-9 (Illustration Booklet, Page 12) for the following steps.

In the following steps, you will mount these two circuit boards in the remaining top housing.

( ) Place the top housing upside down next to the bottom housing.

( ) Place the WVT board in the housing component-side-up. then fasten the board with four 6-32 × 9/16″ spacers and four #6 lockwashers.

( ) Place a #6 stainless steel flat washer over the shaft coming through the board.

( ) Peel the protective backing from both sides of the remaining encoder disc. Position the encoder disc with the painted side down and mount it on the shaft with a 6-32 stainless steel nut, a #6 lockwasher, and a #6 stainless steel flat washer.

( ) Place the WVB circuit board component-side-down with the wires coming out on the same side as the other board. Then, fasten the board with four 6-32 × 1/4″ stainless steel screws.

Refer to Pictorial 9-10 for the following steps.

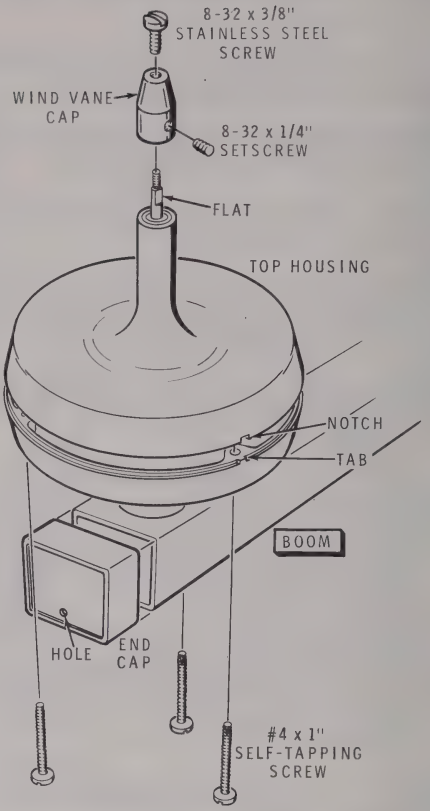
( ) Check the wires coming from each board to make sure they are not touching the disc. Then, turn the top housing right side up and place it on the bottom housing. Make sure none of the wires are pinched between the two housings. Now rotate the top housing until the notch lines up with the tab on the bottom housing.

( ) Spin the shaft with your finger to check for any noise of wires rubbing on the disc. Then, fasten the housings together with three #4 × 1″ self-tapping screws.

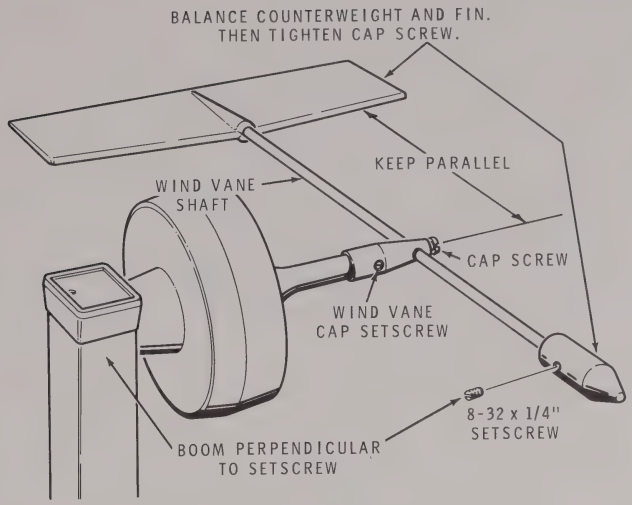
( ) Place the end cap with the hole pointing down and push it on the end of the boom.

( ) Start an 8-32 × 1/4″ setscrew in the wind vane cap. Line up the setscrew with the flat on the housing shaft and tighten the setscrew.

( ) Start an 8-32 × 3/8″ stainless steel screw at the end of the wind vane cap.



PICTORIAL 9-10



PICTORIAL 9-11

Refer to Pictorial 9-11 for the following steps.

( ) Place the boom in a vertical position so the end of the boom (not the cups) is resting on the edge of your work bench.

( ) Insert the wind vane shaft through the wind vane cap with the fin opposite the wind vane cap setscrew as shown.

( ) Start an 8-32 × 1/4" setscrew into the counterweight.

( ) Insert the end of the wind vane shaft into the counter weight as far as it will go. Position the setscrew down and in line with the vertical fin; then tighten the setscrew.

CAUTION: In the following step be **very careful** not to overtighten the cap screw. This would crack the wind vane.

( ) Turn the cap screw in until it is just against the shaft.

( ) Position the fin so it is perpendicular to the boom. Then slide the shaft in the wind vane cap until the fin and counter weight are balanced horizontally. Make sure the fin is still perpendicular to the boom with the counter weight setscrew down; then tighten the cap screw.

This completes the assembly of the wind sensors. Proceed to "Initial Tests" in the Operation Manual.

FOR PARTS REQUESTS ONLY

- Be sure to follow instructions carefully.
- Use a separate letter for all correspondence.
- Please allow 10 - 14 days for mail delivery time.

DO NOT WRITE IN THIS SPACE

INSTRUCTIONS

- Please print all information requested.
- Be sure you list the correct **HEATH** part number exactly as it appears in the parts list.
- If you wish to prepay your order, mail this card and your payment in an envelope. Be sure to include 10% (25¢ minimum, $3.50 maximum) for insurance, shipping and handling. Michigan residents add 4% tax.

  Total enclosed $_____
- If you prefer COD shipment, check the COD box and mail this form. COD ☐

NAME _____

ADDRESS _____

CITY _____

STATE _____ ZIP _____

The information requested in the next two lines is not required when purchasing nonwarranty replacement parts, but it can help us provide you with better products in the future.

Model # _____ Invoice # _____

Date Purchased _____ Location Purchased _____

LIST **HEATH** PART NUMBER	QTY.	PRICE EACH	TOTAL PRICE

TOTAL FOR PARTS	
HANDLING AND SHIPPING	
MICHIGAN RESIDENTS ADD 4% TAX	
TOTAL AMOUNT OF ORDER	

SEND TO: **HEATH COMPANY**
BENTON HARBOR
MICHIGAN 49022
ATTN: PARTS REPLACEMENT

Phone (Replacement parts only): 616 982-3571

THIS FORM IS FOR U.S. CUSTOMERS ONLY
OVERSEAS CUSTOMERS SEE YOUR DISTRIBUTOR

CUT ALONG DOTTED LINE

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- Be sure to follow instructions carefully.
- Use a separate letter for all correspondence.
- Please allow 10 - 14 days for mail delivery time.

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INSTRUCTIONS

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  Total enclosed $_____
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NAME _____

ADDRESS _____

CITY _____

STATE _____ ZIP _____

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LIST **HEATH** PART NUMBER	QTY.	PRICE EACH	TOTAL PRICE

TOTAL FOR PARTS	
HANDLING AND SHIPPING	
MICHIGAN RESIDENTS ADD 4% TAX	
TOTAL AMOUNT OF ORDER	

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Please provide complete information when you request replacements from either the factory or Heath Electronic Centers. Be certain to include the **HEATH** part number exactly as it appears in the parts list.

ORDERING FROM THE FACTORY

Print all of the information requested on the parts order form furnished with this product and mail it to Heath. For telephone orders (parts only) dial 616 982-3571. If you are unable to locate an order form, write us a letter or card including:

- Heath part number.
- Model number.
- Date of purchase.
- Location purchased or invoice number.
- Nature of the defect.
- Your payment or authorization for COD shipment of parts not covered by warranty.

Mail letters to: Heath Company
Benton Harbor
MI 49022
Attn: Parts Replacement

Retain original parts until you receive replacements. Parts that should be returned to the factory will be listed on your packing slip.

OBTAINING REPLACEMENTS FROM HEATH ELECTRONIC CENTERS

For your convenience, "over the counter" replacement parts are available from the Heath Electronic Centers listed in your catalog. Be sure to bring in the original part and purchase invoice when you request a warranty replacement from a Heath Electronic Center.

TECHNICAL CONSULTATION

Need help with your kit? — Self-Service? — Construction? — Operation? — Call or write for assistance. you'll find our Technical Consultants eager to help with just about any technical problem except "customizing" for unique applications.

The effectiveness of our consultation service depends on the information you furnish. Be sure to tell us:

- The Model number and Series number from the blue and white label.
- The date of purchase.
- An exact description of the difficulty.
- Everything you have done in attempting to correct the problem.

Also include switch positions, connections to other units, operating procedures, voltage readings, and any other information you think might be helpful.

Please do not send parts for testing, unless this is specifically requested by our Consultants.

Hints: Telephone traffic is lightest at midweek — please be sure your Manual and notes are on hand when you call.

Heathkit Electronic Center facilities are also available for telephone or "walk-in" personal assistance.

REPAIR SERVICE

Service facilities are available, if they are needed, to repair your completed kit. (Kits that have been modified, soldered with paste flux or acid core solder, cannot be accepted for repair.)

If it is convenient, personally deliver your kit to a Heathkit Electronic Center. For warranty parts replacement, supply a copy of the invoice or sales slip.

If you prefer to ship your kit to the factory, attach a letter containing the following information directly to the unit:

- Your name and address.
- Date of purchase and invoice number.
- Copies of all correspondence relevant to the service of the kit.
- A brief description of the difficulty.
- Authorization to return your kit COD for the service and shipping charges. (This will reduce the possibility of delay.)

Check the equipment to see that all screws and parts are secured. (Do not include any wooden cabinets or color television picture tubes, as these are easily damaged in shipment. Do not include the kit Manual.) Place the equipment in a strong carton with at least THREE INCHES of *resilient* packing material (shredded paper, excelsior, etc.) on all sides. Use additional packing material where there are protrusions (control sticks, large knobs, etc.). If the unit weighs over 15 lbs., place this carton in another one with 3/4" of packing material between the two.

Seal the carton with reinforced gummed tape, tie it with a strong cord, and mark it "Fragile" on at least two sides. Remember, the carrier will not accept liability for shipping damage if the unit is insufficiently packed. Ship by prepaid express, United Parcel Service, or insured Parcel Post to:

Heath Company
Service Department
Benton Harbor, Michigan 49022

HEATH COMPANY • BENTON HARBOR, MICHIGAN

THE WORLD'S FINEST ELECTRONIC EQUIPMENT IN KIT FORM

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